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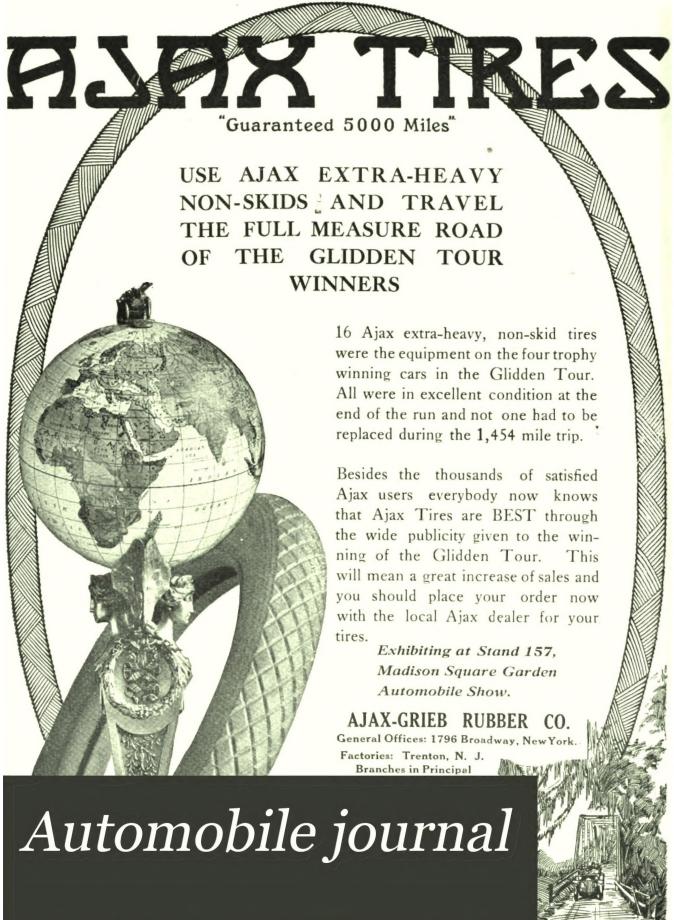
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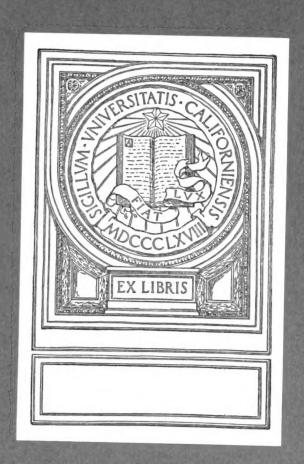
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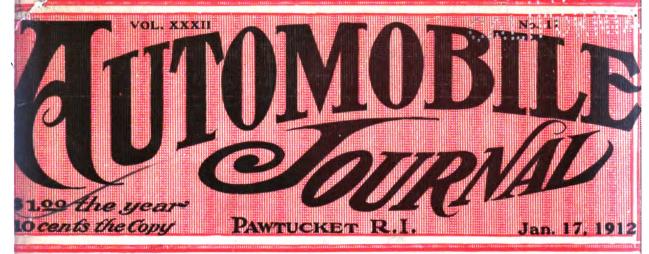
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MOBILOIL is the result of a long series of experiments in the science of lubrication. Every problem that must be met to secure maximum efficiency has been taken into consideration in the manufacture of this product, and the result is a grade of Mobiloil which will give satisfaction under all conditions.

By many practical tests, Mobiloil has proven to be most economical, because it is the best lubricant. It will go farthest, will reduce wear and tear of your engine to a minimum. Least friction gives greatest mileage. Low consumption, sure lubrication, no break downs, no delays, due to carbon deposits on spark plugs, perfect satisfaction; these are some of the characteristics that make Mobiloil best suited for automobile lubrication.

A GRADE FOR EACH TYPE OF MOTOR

VACUUM OIL COMPANY,

Boston, Mass.

Gentlemen:-

For the benefit of our customers, who are driving Knox cars, we recommend Vacuum Mobiloil, as we have adopted this as our standard oil, and are now including it as a regular equipment on all finished cars.

Yours very truly,

KNOX AUTOMOBILE COMPANY,

JMC-X

J. M. Collins, Purchasing Agent.

VACUUM OIL COMPANY

Rochester, U. S. A.

EASTERN | Boston 49 Federal St. New York, 29 Broadway BRANCHES | Portland, 117 Commercial St. Bangor, 154 Exchange St.

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We Will Exhibit at the New York Madison Square Automobile Show, January 6th to 26th, booth number 188.

The Largest Automobile Supply House in America.

FIFTEEN STORES IN THE UNITED STATES.



Mr. Chas. E. Miller, 97 Reade Street, New York, M. Y.

Dear Sirt-

You will remember that for the past two or three years we have had an insert in your catalogue, and the criter has just asked the circulation department to check up the results, and finds that the returns are very satisfactory. We are desirous of having the arrangement continued, and if agreeable to you, you may take this letter as your authority for reserving the same privilege for us in your 1912 catalogue.

It is very interesting to note that the returns are even better from year to year as the circulation of your catalogue increases. We are writing you frankly in regard to the results as we ourselves sell advertising, and always appreciate it when a customer gets returns.

Will you please advise us in ample time for us to prepare the usual insert. It might also be well to advise us what weight of paper you will allow us to use this year.

Accessory

Manufacturers

Read copy of "MOTOR" letter. IT'S INTERESTING. We have received similar letters from other Trade Journals regarding the value of OUR CATALOG, which is the most complete one of its kind ever published.

We are now collecting data for our 1912 Annual Catalog, which will contain 250 or more pages and will have a circulation of 100,000 Copies and

WILL BE MAILED ALL OVER THE WORLD

November 2, 1911. Advertising Manager

15 STORES—WHAT'S THE ANSWER?

We now have 15 STORES and handle the LARGEST ASSORTMENT OF AUTOMOBILE SUPPLIES to be found in this country. OUR PRICES are quoted F. O. B. each branch. This saves the delay and expense of delivering your material to the trade in and around the cities where our branches are located.

PROPOSITION.

We will be pleased to receive proposition from Accessory Manufacturers regarding cataloging and handling their material during the season of 1912.

SEE OUR EXHIBITS AT BOTH NEW YORK AUTOMOBILE SHOWS

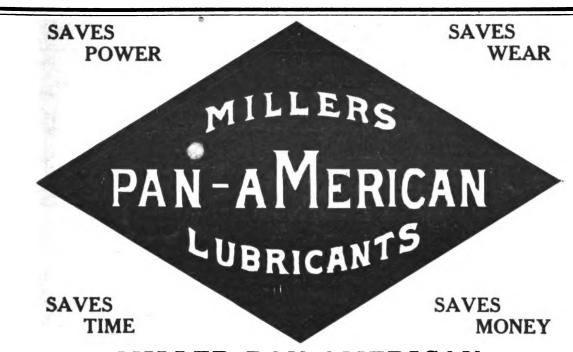
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SEE PAGES I, II and III OF THIS JOURNAL.

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MILLER PAN-AMERICAN Motor Cylinder Oils

are refined from the finest grade Pennsylvania Crude and are a pure, distilled, highly-filtered mineral oil.

GEAR CASE COMPOUND

Made in Three Densities---Light, Medium, Heavy

All have a low cold test and high melting points and retain their various consistencies at varying temperatures.

In order to convince you of the efficiency of these lubricants we are willing to make you a special price for an initial order, much lower than usually quoted on other high grade oils and greases.

Guaranteed the Equal of any high grade Oil on the Market at any price.

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The Largest Auto Supply House in America CHAS. E. MILLER

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WE CLAIM FIRST PLACE

The Largest Automobil

"THE PIONEER"

We started in this business years ahead of the other supply houses. and are farther ahead now than ever before.

WE HANDLE ONLY THE BEST MATERIAL ON THE MARKET

and carry new, clean, fresh stock at each Branch. We do not handle job lot or second-hand material of any kind.

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ESTABLISHED 1896.

"TRY MILLER"

This Expression Has Developed Into a Trade Term.

"There's a Reason."

The public, which in the past has experienced difficulty in obtaining Automobile Supplies, should give us a trial by mail or a personal visit.

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Oakland "The Car With a Conscience"



Model "40" Victoria---\$1450 (Top Extra).

The Well Balanced Motor Car.

An automobile is just as strong as its weakest unit. The service rendered depends largely upon the relationship of one part to another Of what use is the powerful motor if the clutch is bad? Or a good clutch if the transmission is not correct? Or a good transmission if the driving shaft is weak? The relationship of one part to another must be scientifically correct. The ideal car, too, must be of medium weight, insuring longer life to tires and fuel economy.

Every principle employed in Oakland construction is founded on satisfactory service. Don't forget that.

During the 1911 season, Oakland cars started in nineteen events, and won fifteen firsts, three seconds and a third: a consistent showing, conclusively proving superior design and construction.

OUR 1912 LINE OF 30, 40, 45 H. P. MODELS.

Model "45" Specifications
4-cylinder, 4½ x 5½ inch motor, unit
power plant; 120" wheel base; Schebler
Carburetor; Bosch magneto; full floating rear axle; tires 36 x 4½".

Model "40" Specifications
4-cyl., 4\%" x 4\%" motor (unit power plant); 112" wheel base; Schebler Carburetor; Remy magneto, (dual system); tires 34" x 4".

Model "30" Specifications 4-cyl., 4" x 4" motor; 106" wheel base; Schebler Carburetor; fin tube radiator; thres 34" x 3½".

Body Design Model "30," Touring Car, 5-Passenger—\$1200.

All Models Ready for Delivery.

Established dealers are invited to make early application for available territory.

Oakland Motor Car Co.,

2550 Oakland Avenue, Pontiac, Michigan.

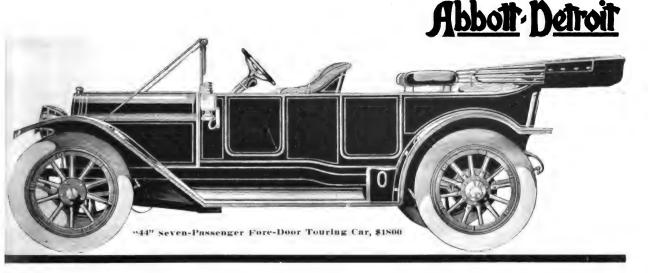
Direct Factory Branch, 1600 Broadway, New York City

See Exhibit at the New York Show



These Abbott-Detroits Made Records We Are Proud of

They were entered in the Savannah races—the Vanderbilt, Grand
Prix and Tiedeman Trophy contests for one purpose alone—to
prove their durability and me
chanical perfection. It took nerve
to enter them in such contests
against high priced, extremely
high powered cars yet it paid
because the Abbott-Detroits
made good.



Read the Consistent Showing nade by these Abbott-Detroits in Vanderbilt and Grand Prix Races

First \$1800 car entered in Vanderbilt or Grand Prix.

Same two cars competed in both races.

Run on high gear at all times.

Grand average 61.25 miles per hour for total mileage of 652 miles, and made 91 miles per hour on

Abbott-Detroit cars still running when race was called off-sixth and seventh place in Grand Prix and seventh and eighth in Vanderbilt.

No inspection of mechanism during any performance no tire trouble.

Abbott-Detroit only team running intact at the end of Grand Prix races.

Send for the interesting story of these races, the Trail of the "Bulldog" and for our Art Catalogue



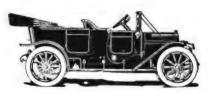
Chicago Show Jan. 27 to Feb. 10

Section K First Floor

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Abbott Motor Company

605 WATERLOO ST., DETROIT, MICH.



Abbott-Detroit "30"

Five-Passenger, Fore-Door Touring Car

\$1350



Abbott-Detroit "30" Colonial Coupe, fully equipped

\$2150

90



Abbott-Detroit "44"

\$3000 Fore-Door Limousine, fully equipped Any model will be equipped with complete dynamo electric lighting system Abbott-Detroit Self-Starter 50

The Question the Motorist Asks —and the Answer

All of the advertising of the Warner Auto-Meter, practically, is devoted to answering one question. We do not have to advertise its accuracy, its reliability, its dependability under all service conditions. For these are everywhere admitted without argument. In important tests or races the Warner Auto-Meter is the only speed-indicating device considered. But the one question which occurs to some motorists—especially experienced ones—is:

"Can I get as good a speed-indicator as the Warner Auto-Meter for less money?"

Or, to put it a little differently, "Will a lower priced speed-indicator give me good enough service?"

Let us consider that question logically.

There are some lines where a lower cost merely decreases the length of service or lessens the beauty of appearance.

One tailor, for instance, may make a suit of clothes for twenty-five dollars, while another charges fifty.

Of course, the material, the workmanship, the appearance of the cheaper suit will be greatly inferior to those of a better one. But it will still serve all the purposes of a suit of clothes, and perhaps give almost the same wear in proportion to price.

So its purchase at times may be a justifiable economy, because of the "good-enough" service it gives.

In the case of a speed-indicator there is no "good-enough" service

It is either absolutely accurate—it either tells you just how fast and how far you're going—or it does not really tell you anything at all. And it is just that absolute accuracy that makes the Warner Auto-Meter at once the aristocrat of speed-indicators and the highest priced speed-indicator made.

The cost of the Warner is not in the pieces of metal which constitute it

—but in the hours of labor of expert workmen, in the perfect adjustment of related parts, in the delicate balancing of the almost infinitesimal jewel bearings, and in the careful testing and checking of the perfection of each step as the work proceeds.

But these things also furnish the reasons that make the experienced motorist put the Warner Auto-Meter on his car. And they answer, too, the question of the motorist of less experience.

Our interesting booklet is free. Write or call for it.

WARNER AUTO-METER

"The Aristocrat of Speed Indicators"

The Warner can be secured through reputable Automobile dealers in any city or town in the United States. Warner branches are maintained in all the principal cities for the convenience of these dealers and their customers. Inquiry to Beloit or at our branches is invited for Warner literature.

WARNER INSTRUMENT CO.

Main Offices and Factory 1231 Wheeler Avenue

Beloit, Wis.

FREE TO AUTOMOBILISTS. A vest-pocket "Automobile Expense Record" tab indexed for conveniently keeping account of tires, gasoline, oil, repairs, etc. Sent FREE for name and model of your car. Address A. T. Jarvis, Booklet Department, Warner Instrument Co., Beloit, Wis.

BRANCH HOUSES MAINTAINED AT

Atlanta Cleveland Kanasa Gity Pittsburg*
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Model M2, Price \$125
Nino Other Models From \$50 to \$145
See Catalog



Ford Model T Delivery Car

y reason of established efficiency this Delivery Car fits into the wants of business like e telephone. It extends your business. It is simple in design and strong in mechanical construction. Cheap in operation—a glutton for work—and sold at a price that has created an almost giversal demand.

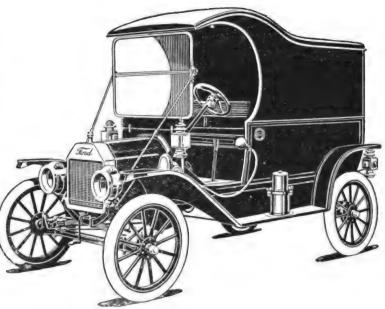
\$700

illy Equipped - * - F. O. B. Detroit

This price includes full equipment—Automatic Brass Wind Shield, Speed-ometer, Ford Magneto built into the motor, two six-inch Gas Lamps and Generator, three Oil Lamps, Horn and and [Tools, No Ford Cars sold unequipped.

Capacity of this Universal Delivery Car is 750 pounds of merchandise.

We did not offer Ford Model T Delivery Car to the siness world until we had thoroughly tried it out in every line of work that business makes for a Delivery Car. Now—after two years of experience in livering merchandise—two years over city streets of sorts—over country roads—in hilly territory in allets of weather—winter and summer—we know this will "deliver the goods." We therefore recommend red Model T Delivery Car with our broadest warnty as a dependable, economical, durable, convenience, money-saving delivery car—for the big store, for little store—for the city, town, village, or country.



The purchase price is low, and the maintenance—from facts established during continuous service—about five cents per mile.

At present we can make immediate delivery but the way orders are coming in prompts the suggestion that you place your order without delay. Ford Model T Delivery Car has the same Vana-

Ford Model T Delivery Car has the same Vanadium Steel Chassis which has made Ford cars so practically useful and popular the world over. It has a handsome pressed steel body with a merchandise carrying capacity of 750 pounds.

Four thousand Ford dealers scattered all over the country will give your order prompt attention.

Fixed Prices on Quantity Orders For Ford Motor Cars for Commercial Purposes

To concerns who purchase Ford Cars in quantity lots for Commercial Purposes we will give the benefit a rate reduction or discount, we have fixed a sliding scale of prices which will be submitted on request talogs and detailed descriptive literature will be mailed gratis. Branch Houses and Large Distributors in Principal Cities—Dealers Everywhere.

Ford Motor Company

Detroit, Michigan, U.S.A.

Some Territory in New England Open for a Few Representatives.

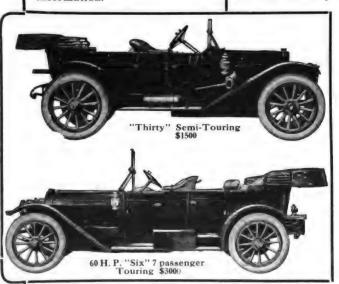
The comprehensiveness of the KisselKar line affords the dealer the advantage of concentrating his energies on one line, and restricting his business relations to one manufacturer.

The distinctive pleasure car values, and special KisselKar features such as the Semi-Touring body, give the KisselKar dealer decisive sales advantages. Increase in output for 1912 will let us add a few more New England representatives. Write for full information.

KISSELKAR

Every Inch a Car

COMPARED with any other car, the KisselKar, model for model, is the superior value for 1912. The KisselKar is built to meet a standard and not a price. The \$1500 "Thirty" has 116 in. wheel base, which is more liberal than on any other car approximating the price—and the tonneau is proportionately roomier and easier riding. Both the "Forty" \$1850, and the "Fifty" \$2350, are roomier, more comfortable cars than the price buys in any other car. The 60 H. P. "Six" \$3000 is the most conspicuous value in the history of the industry.



Special KisselKar Shows

To show the full KisselKar line to best advantage, we will hold special KisselKar shows in New York and Chicago at the same time as the regular automobile shows

New York, 137-141 Madison Ave., cor. 31st St., Jan. 1st o 30th.

Chicago, 2515 Michigan Ave., Jan. 27 to Feb. 10th.

Exhibit at regular Chicago automobile show as follows: Pleasure Models—Section .E.1, First Regiment Armory. Commercial Vehicles—Section F., Coliseum.

60 H. P. "Six" \$3000 "Fifty" - - - \$2350 "Forty" - - - \$1850 "Thirty" - - \$1500

Except the "Thirty" which has more than regular equipment, KissellKar prices include full equipment—demountable rims, shook absorbers, speedometer, lamps, gas tank, glass front, top, etc. — everything belonging to a perfectly equipped and finished car.

Complete Line of Commercial Vehicles



The KisselKar line of trucks, delivery wagons public utility vehicles—meet every haulage and delivery need—economy of gasoline, excess capacity and reserve power, make them economical under every condition of service. 1½ to 2—3—4—5 ton.

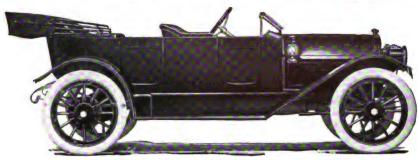
Write for Big Automobile Book

This is one of the most comprehensive and informing automobile books ever published—illustrates and describes the entire KisselKar line—it will give you a new standard by which to judge automobile and commercial vehicle values. Free. Write today.

Kissel Motor Car Co.,

174 KISSEL AVENUE, HARTFORD, WIS.

Three Astonishing Prices



u get EVERY-HING in an IM-RIAL.

unt the features of ich all other manuturers boast—some one, some of other. Then come the IMPERIAL of or 1912 and you them ALL.



Long Stroke Motors;
Silent, Enclosed
Power Plant;
Big Wheels, Long
Wheelbase;
Four Real Doors;
Center Control;
Demountable Rims;

Self Starter.

ach of These Fully and Completely Equipped

MODEL 44 \$1750 Touring Car Each of these is a WHOLE car, with top, windshield, speedometer, gas lamps, Prest-O-Lite tank, tools, etc. When you see these handsome cars at Grand Central

Palace, New York, at Boston, at Philadelphia and other shows, you will realize that these are indeed astonishing three's a coupon that will bring

one 1912 catalog.

<u>VE</u> EALERS:

EALERS:

Not much territory left for 12, but you may be the lucky e. Write us quick for a splen-1 proposition.

MODEL 33 \$1250 Roadster

COUPON—USE IT NOW.
Imperial Automobile Co.,
Jackson, Mich.

Please send your 1912 Catalog. (Name) (Address)

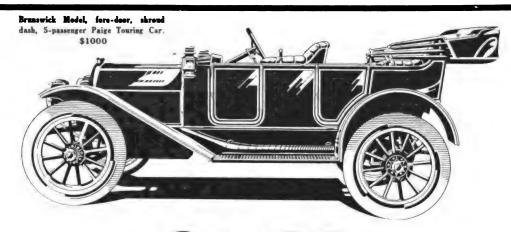
IPERIAL AUTOMOBILE COMPANY

MODEL 34

\$1400

Touring Car

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PARTICULARLY DISTINGUISHED BY ITS POWER PLANT

The unusual value of the Paige line is enhanced for 1912 by the addition of this new Brunswick Model, and these new features which are included as regular equipment without adding one cent to the selling price.

DISCO SELF-STARTER—CORK INSERT CLUTCH -ENCLOSED VALVES-DELCO IGNITION

NO other automobile in the world offers so much value at the Paige prices. You need not simply take our word for this. Make every possible kind of comparison, all up and down the line, throughout our price field. You will find the Paige clear out in front-a really high-grade, low price car.

SPECIFICATIONS-ALL MODELS

Wheelbase-104 inches. Cylinder cast enbloc, 3% inch bore, 4-inch stroke. Unit power plant; self-contained constant level splash lubrication system, maintained by plunger pump and sight feed on motor.

Halcomb Electric Nickel Steel transmission gears; R. I. V. annular and Hyatt high-duty bearings. Cork insert multiple disc

clutch running in oil.

Delco ignition. Disco self-starter. Tires, 32 x 31/2, Diamond or Firestone.

Five black enameled lamps, horn, tools, jack, tire re-pair kit with each car.

THE NEW MODEL BRUNSWICK

is another step ahead,—a large, comfortable, five-passenger touring car that the whole family may ride in. It has all the seat and leg room any motorist will desire. It is a touring car with more power, under full load, than is required for the worst of roads or the steepest of hills. We know, because for months before we announced this model we put it to severer tests than any owner ever will. It is a car of graceful lines, elegantly finished, and comfortable to the extreme,—a car for exacting motorists.

The new Paige refinements of construction—found in all 1912 Paige models—have heretofore been found only in higher priced cars. And thus the Paige retains its leadership,—strong with its added features but with nothing added to the price.

price.

Before you decide on any popular-priced line see the Paige and write to us.

PRICES AND **EOUIPMENT**

Brunswick, 5 - passenger Touring Car.......\$1600 Beverly, Torpedo Type Touring Car..... 973

Kenilworth, 3 - passenger Roadster 975 Brooklands, Mile-a-minute

LaMarquise, 4 - passenger Colonial Coupe (full elec-

Rockland, Runabout with Folding Deck, Auxiliary Tank \$ 925

Pinehurst, Surrey Type. Detachable Rear Seats \$ 900

Paige-Detroit Motor Car Co., 249-259 21st St., Detroit, Mich.

THE FIRST TOURING CAR UNDER \$1000 WITH SELF-STARTER



"Twenty-Five" 5-Passenger Touring Car 110 INCH WHEEL BASE



F. O. B. Detroit

Equipped with SELF-STARTER, 32x3 1/2 tires, dual ignition, demountable and quick-detachable rims, gas tank, extra rim, top, windshield, 5 lamps, horn, tools and tire repair kit—LONG STROKE MOTOR—3 SPEEDS—ENCLOSED VALVES— MAGNETO.

Think of it! Read these equipment details over again-note the specifications shown below. Is it any wonder that dealers are demanding territory by wire, 'phone, special delivery and in personthat letters by the bushel are already evidencing the public demand for the car?

A \$5000 car could give no better service, no greater satisfaction—\$2000 would not buy you as great value anywhere else.

Strong statements? Yes. But we hope you'll challenge them—that you'll compare the car, item by item, with any other you have in mind at \$2000, or more.

SEE US AT THE SHOWS
We can't tell you a hundredth part about the R-C-H
in a magazine page. But we'll be at the Grand Central Palace Show, New York, January 10th to 17th—
Booth B, lower floor. Examine this wonderful car
there, or at any of our branches or dealers.

STANDARD MODELS

Regular equipment of top, windshield, lamps, generator, horn, tools, and kit, without self-starter and other special equipment quoted above.

5-Passenger Touring Car\$8	50
Touring Roadster 8	
Roadster 7	
Roadster equipped for 4-passengers 7	50
Colonial Coupe	50

CANADIAN PRICES

Standard Models SS Models

Roadster 850	
	975
Roadster—4 passengers 925 Coupe	1050 1425

All prices f. o. b. Windsor, Ont., duty paid. **GENERAL R-C-H SPECIFICATIONS**

Motor—4 cylinders, cast en bloc—3½ inch bore, 5 inch stroke. Two-bearing crank shaft. Timing gears and valves enclosed. Three-point suspension. Drive—left side. Irreversible worm gear, 16 inch wheel. Control—center lever operated through H plate, integral with universal joint housing just below Springs—front, semi-elliptic; rear, full elliptic and mounted on swivel seats. Frame—Pressed steel channel. Axles—Front, I-Beam, drop-forged; rear, semi-floating type. Body—English type, extra wide front seats. Wheel Base—110 inches. Full equipment quoted above.

R. C. HUPP, Manufacturer DETROIT, MICH. Distinct from and having no the Connection whatever with the Hupp Motor Car Company.

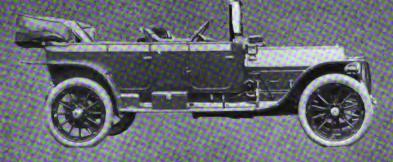
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Model SS R-C-H "Twenty-Five" English Body Roadster \$800 Model SS R-C-H Touring Roadster Model SS R-C-H Colonial Coupe

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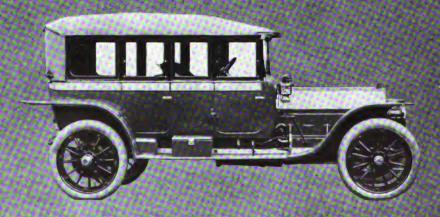


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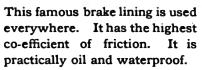
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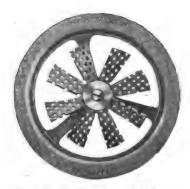




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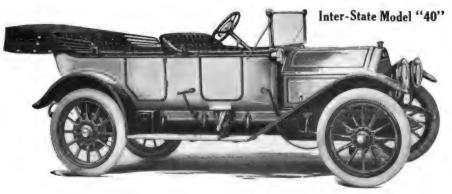
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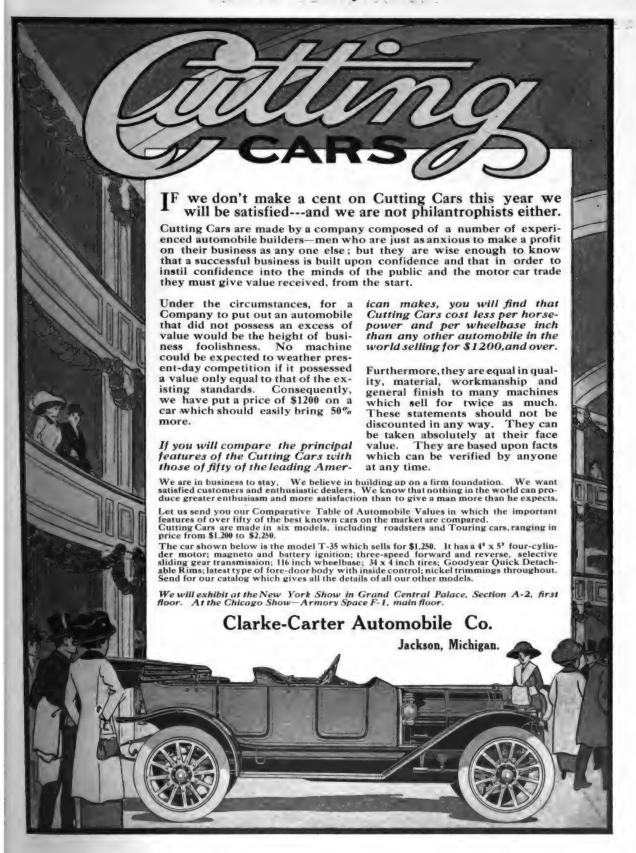


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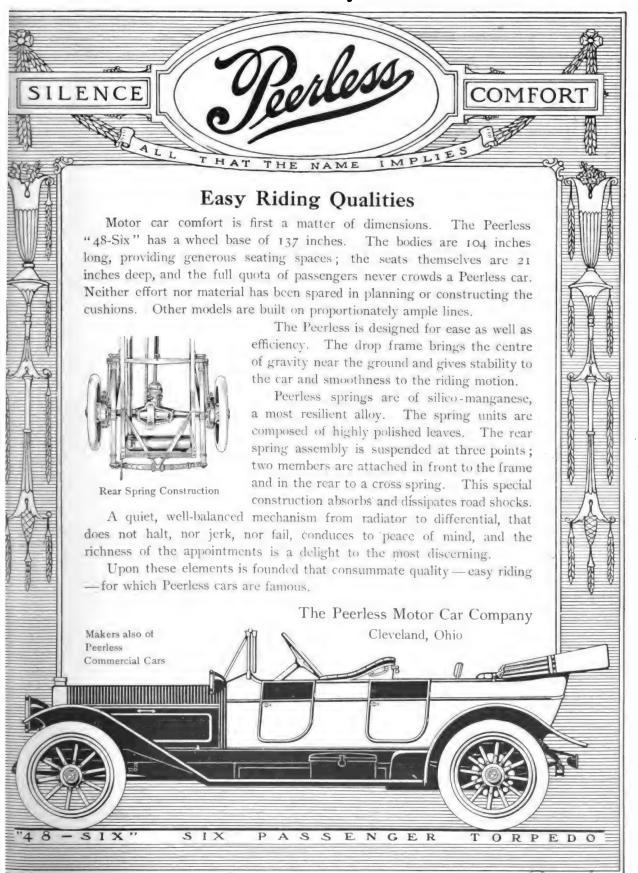


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THE SHOWS REVEAL AT HOME AND ABROAD

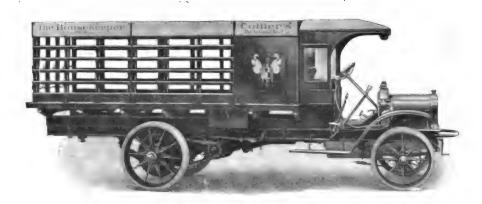
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TO THE WORLD





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1500-lb. delivery wagons, 1 1-2 ton, 3-ton and 5-ton trucks---all with a universal type of power plant.

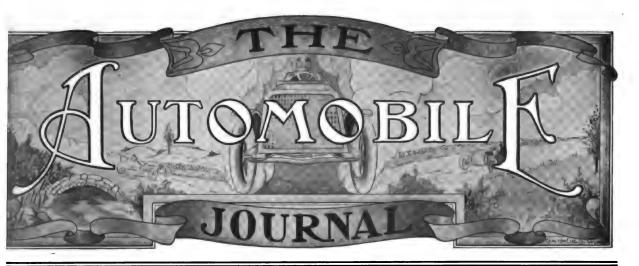
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DL. XXXII, No. 11

JANUARY 17, 1912

Price \$1.00 the Year

exhibits, usually there have been

several items re-

served for presentation at the

show. While this is still true in a

measure, it is

somewhat notice-

able this year that radical de-

velopments along

this line are miss-

ing. This should

not be taken to

mean that there is nothing new

at the show. For

many this has proven the first

inspect the new

types of cars,

which have been

announced for

weeks, but when

special reference

is had to the me-

chanical features

prepared for an-

t o

opportunity

PLEASURE CARS AT GARDEN SHOW. 77

efinement in Body Design Rather Than Mechanical Innovations Noted---Valveless Motors, Self-Starters and Electric Lighting Prominent Features.

EFINEMENT is the keynote of the 12th national automobile show which opened in the Madison

Square Garden, New York City, Saturday evening, Jan. 6, and will continue until 11 in the ening of Jan. 13. This applies to pleasure cars

ıly, since a week's cond under anlav same auses will be deted entirely to mmercial vehies, beginning onday morning. cidentally, this the last motor exhibition l r nich will be eld in this hisric structure. id the arrangeents for the splay have all en carried out ith this fact in ind. The event under the mangement of the utomobile pard of Trade, presented by following hе

low committee:

il. George Pope,

airman; Merle



General View of Madison Square Garden Show, New York City, as Seen From the Entrance.

Downs, secretary; Col. Charles Clifton and Alfred

In more recent years the annual displays of motor

nouncement during the display, these are much less in number than formerly. Instead, there has been a well defined movement toward the presentation of details

vehicles in New York City have been regarded by the

manufacturers as opportunity for them to bring out new designs or features of construction. While the

practise has been to announce the models for the

forthcoming season some time in advance of these

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THE AUTOMOBILE JOURNAL.

chassis, the design of the body or class of fittings. view of the widespread discussion evolved by the Hardly an exhibitor of cars has neglected to include one or more vehicles which present the very highest Columbia, Stoddard-Dayton and Stearns model skill of the coach worker, both inside and out. This in itself will prove a revelation to many, since it is exemplified in a most striking manner, that American motor car manufacturers are able to produce body designs which vie with the best that can be obtained, albeit foreign makers have long regarded this as a superior feature of their products. In this respect at least, the 12th Madison Square Garden display more nearly approaches the beauty of the Paris Salon or the Olympia show in London.

But let it not be supposed that the plans of the producers have overlooked the mechanical side of motoring. Probably the citizens of no other nation

of refinement; either in the construction of the called silent motors. This is not at all strange, adoption of the Knight sliding sleeve engine. equipped with this type of power plant were announced some months ago and the displays made by these con cerns are well patronized. The Atlas-Knight mad its appearance less than a month before the shore opened, and was first seen during the display. It understood that several other companies are working on Knight models which are soon to make their debi under the 1913 announcement. A number of other non-poppet valve motors are to be seen in the access sory division.

> Self-starting devices vie with electric lighting equipment in securing attention from the visitors. Is many instances cars thus equipped are so arrange



the Main Floor, Madison Square Garden Display, Taken from the Rear, Showing Large Number of Models on Exhibit, and Attractive Appearance of the Interior,

are so well versed in the mechanical operation of their cars as those of America. Attendants at the exhibits long ago learned that they must be prepared to answer every conceivable question regarding the construction of their cars. Those who visit the national shows are well able to judge the merits of the respective machines, regardless of outward appearance. For a number of years many firms have presented stripped and polished chassis, and in some instances these have been so arranged that it was possible to examine the more important working parts. Those who have visited the Madison Square Garden this year have been surprised to note that nearly every manufacturer has prepared a demonstration of this character.

Of course, the greatest interest attaches to the so-

that the public is invited to test the appliance and learn from first hand knowledge just how easy it is to operate a self-starter. Many designs, not fitted to cars, are to be seen and studied at the accessory hooths

In the matter of decorations, the 12th national show in Madison Square Garden surpasses all previous occasions. The entrance from Madison avenue is through an immense bower of greenery, against \$ white background, which proves a splendid foretaste of what is in store within the building proper. Half hidden away in the thick boxwood hedges are marble figures sculptured by Martini, and standing on tall pedestals present a most pleasing artistic effect.

Entering the arena, the visitor is confronted by a large fountain, back of which is a statue representing re "Era of Motors." Eight bust figures on pedestals of feet high and arched by garlands of natural flows surround the fountain, and half a dozen bay trees re arranged in front. High over all is an immense riental rug, said to weigh some three tons. It retches from wall to wall and contains a centre panel leasuring 200 by 100 feet, fringed by 24 smaller anels. In the centre piece is an impressive female gure typifying "The Triumph of the Industry," and he whole canopy is gracefully draped with garlands f flowers.

The elevated platform and balcony are set off by pecial railings, which like the stairways, are finished a white and gold. The whole is supported by large thite and gold, and crimson pillars, which add much the stateliness of the effect.

Exhibition Hall has been transformed into a Calicornia scene, the grape arbor setting being particularly platform. Ample room is afforded for all, because of the fact that many of the accessory manufacturers have divided their space between Madison Square Garden and the Grand Central Palace, in the latter of which the 12th annual show of the National Association of American Manufacturers will open Jan. 10.

The Olds Motor Works, Lansing, Mich., has the first space on the right of the main floor, upon entering the building. Here the principle item of interest is the new Oldsmobile Defender model, shown as an inside driven coupe, with centre control levers, although the same chassis is fitted with touring, tourabout and roadster bodies. In addition to an electric lighting equipment a self-lighting gas system also is employed.

The White Company, Cleveland, O., has the next space, and here without doubt the chief attraction is the new six-cylinder, self-starting White model. This



Looking Down One of the Aisles on the Elevated Platform Where Motorcycles and Accessories Are Shown, Giving an Excellent Idea of Decorative Scheme,

appropriate. A huge pergola extends about the room, while stretching around the four walls is a landscape painting by Pal representing a golden sunset in southern California.

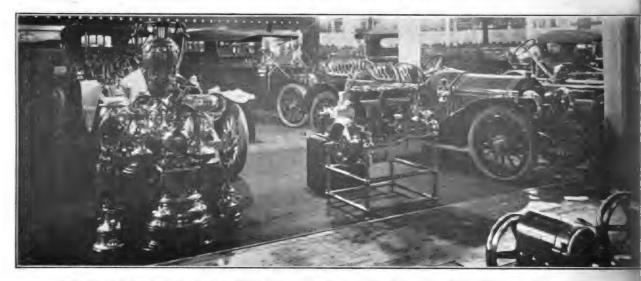
Concert Hall is a bit of old Japan. A canopy of white cherry blossoms, extending from branches of real cherry wood, forms a beautiful bower. The artificial blossoms are delicately scented, thus adding to the realistic effect. About the walls is a panoramic landscape depicting the "Land of Flowers" with Fuji Yama, the sacred mountain of Japan, towering in the distance.

The cars are displayed on the main floor, Exhibition Hall, elevated platform and balcony. Accessories may be seen in Concert Hall, elevated platform, balcony and basement, while motorcycles are shown this year during the pleasure car week on the elevated

motor is one of the first six-cylinder engines in America to be produced with cylinders cast en bloc. With the exception of the Fiat it is said to be the only machine employing a long stroke six as well.

Space 3 is occupied by the Dayton Motor Car Company, Dayton, O., with the Stoddard-Dayton line, including the Knight engined model. Here this motor is shown in a case, with the working parts clearly defined. The interior of the engine has been fitted with electric lights, which display signs indicating the various functions in a neat and attractive manner.

Next is the Oakland Motor Car Company, Pontiac, Mich., with an Oakland chassis so arranged as to bring out the features of the new three point suspension of the unit power plant and the inclined position of the frame to effect a straight line drive. Numerous other new details of construction are to be noted, in-



Display of the National Motor Vehicle Company, Indianapolis, Ind., Also Offers Self-Starting Models,

cluding cone clutch instead of multiple disc, threequarter elliptic springs, propeller shaft enclosed within a torque tube, control levers within the body, etc.

The exhibit of the Pope Manufacturing! Company, Hartford, Conn., at space 5 includes a large number of Pope-Hartford models, as well as a stripped chassis. The new feature is a front door roadster for eiffer two or four passengers, the low rakish body and tilted seats calling forth much favorable comment.

At the rear of the main hall is the display of the F. B. Stearns Company, Cleveland, O., and the Stearns-Knight motor in a glass case is the centre of a large crowd most of the time.

The Lozier Motor Company, Detroit, Mich., maker of Lozier cars, has the next space. A new two-seated Meadowbrook model, finished in ivory white, is a decided attraction here. The two seats and body are built in one section completely enclosing the gasoline

and oil tank, and a luggage carrying compartment, on the top of which is the space for spare tires.

The only air-cooled car in the show is to be seed at the booth of the H. H. Franklin Automobile Company, Syracuse, N. Y. Several important change in construction are noted, among them being the elimination of the auxiliary exhaust valves, the substitution of a new circulating oil system for the old mechanical oiler type, etc.

The Winton Motor Carriage Company, Cleveland O., has space 9. Inasmuch as it is one of the original exponents of the self-starting system, the Winton is of particular interest, albeit others in the show are attracting rather more attention because of their more recent adoption of such devices. There is but one model this year, a 48.6 horsepower six-cylinder.

Space 10 is occupied by the Locomobile Company of America, Bridgeport, Conn. A smaller six-cylinder



The Display of the Corbin Motor Vehicle Corporation, New Britain, Conn., Presents an Attractive Appearance.



A Complete Line of Jackson Models Is to Be Found at the Space of Jackson Automobile Company, Jackson, Mich.

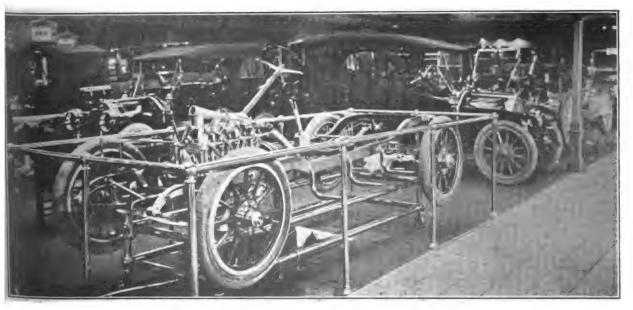
aodel denominated the little six-38 Locomobile, is the mportant feature of the display. The space under the ront seat is occupied by the gasoline tank, two spare emountable rims with tires are carried in the rear of he tonneau, and the tool box is located under the loor of the car.

The next space presents the line of the Peerless fotor Car Company, Cleveland, O. The Peerless exhibit is particularly dignified in appearance, and induces two new chassis with six-cylinder motors rated it 38 and 40 horsepower. Probably the most notable improvement in equipment is the adoption of the Fray & Davis electric lighting system, although this has been announced some months. However, the endre display bears out the contention of the Peerless company that it always has been ready to make any

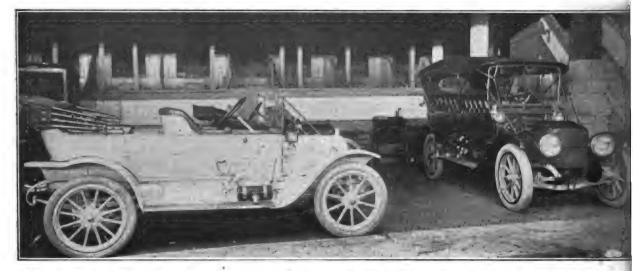
little changes that would add to the comfort of passengers or to the convenience of the operator.

Next to the Peerless is the Mitchell, made by the Mitchell-Lewis Motor Company, Racine, Wis. The four new chassis have a number of changes, chief among them being the substitution of the L head motors for those of the valve-in-the-head type. There are but three new motors and these are all alike, the only difference being in the horsepower rating.

The Stevens-Duryea Company, Chicopee Falls, Mass., has the last space on the outside of the main hall. The members of the drive line, including the crankshaft, drive and rear axle shafts are shown in the same relative position as when installed in Stevens-Duryea cars, the chassis being raised slightly from the floor to permit of placing these underneath. At-



Overland Carn Are to Be Seen in a Variety of Body Design a tt the Space of the Willyn-Overland Company, Toledo, O.



Space of the White Company, Cleveland, O., Presents the New Self-Starting Six-Cylinder White Car.

tention also is called to the method of connecting one member of the drive to another by a square and taper shape.

Having encircled the hall on the outside, the first space to the right of the centre is that occupied by the Buick Motor Company, Flint, Mich. There are no radical changes in the Buick line, but many little refinements are to be noted.

Space 15 includes the exhibit of the Willys-Overland Company, Toledo, O. Overland cars are presented in four distinct chassis designs with nine differing bodies. What is expected to be the most popular is the five-passenger fore door touring model. Special attention has been paid to the matter of brakes throughout the entire line. Thermo-syphon cooling is employed on all and for this year the aluminum intake and return water pipes have been increased in efficiency from 25 to 75 per cent.

Next in order is the display of the Cadillac Motor Car Company, Detroit. As is well known the Cadillac is equipped with the new Delco self-starting and liging system, and this feature is brought very forcito the attention of the visitor.

Space 17 is occupied by the Packard Motor Company, Detroit, Mich. Only one model is shot this being a six-cylinder chassis stripped and equip with phaeton body. The chassis is located within brass railing, setting off its features in a particular attractive manner.

The Maxwell-Briscoe Motor Company, Tarryton N. Y., has space 18. Here is displayed the full leaf Maxwell cars, including a stripped chassis equipped with the new Victor self-starting device. Special terest attaches to this display because of the fact the Maxwell Mascotte now holds the Glidden trophone of the prizes which occupies an important position every national automobile show.

The Pierce-Arrow Motor Car Company, Buffa N. Y., has the space on the opposite side of the cent The three Pierce-Arrow models are continued for 19



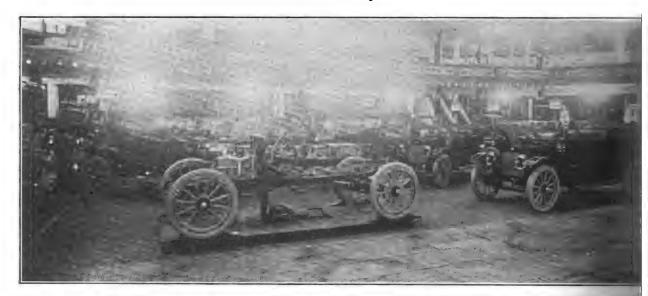
Haynes Cars Make an Attractive Display at the Stand of the Haynes Automobile Company, Kokomo, Ind.



MICHELIN

STEEL STUDDED LEATHER TREADS

Anti-Skids Do Prevent Skidding



Reo the Fifth Is the Chief Attraction of the Display of the Reo Motor Car Company, Lausing, Mich.

with several notable details of refinement, in fact it may be stated that the body designs are all radically different. All have fore doors and flush sides, with control levers on the inside. Ventilators are supplied by hinged doors in the baseboard of the windshield. The demand for electric lighting has resulted in making provision for the attachment of an electric generator, drive to this being through a clutch coupling with the rear end of the pump shaft. Starting is facilitated by a priming equipment, by means of which a pump on the dash sprays gasoline into the manifold through a special nozzle.

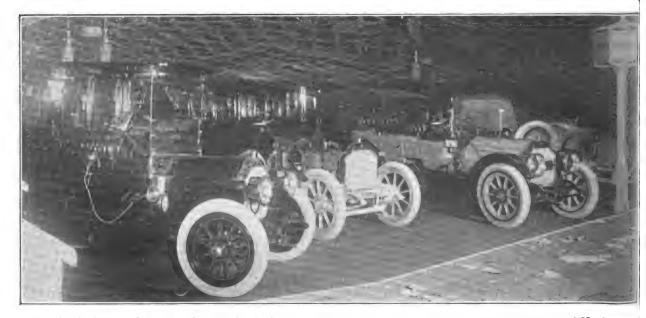
The Hudson Motor Car Company, Detroit, displays the new self-starting Hudson, this feature being brought out in a striking manner by the use of an illuminated chassis. The system is the Disco. One chassis design and six body styles comprise the line,

which is marked by a number of detailed refinement though none of the changes can be regarded as radical

The next space is occupied by the Chalmers McCompany, Detroit, also with a self-starting engine chassis has been cut away so as to show end working part in actual operation, and the publication of the pu

The Reo Motor Car Company, Lansing, Mich., presents a stripped chassis. The principal feature the exhibit is the new Reo the Fifth, which is scribed in detail elsewhere in this issue.

The last space on the main floor is that of Studebaker Corporation, Detroit, showing E-M-F I Flanders cars. One of the 20 horsepower Fland chassis is shown sawn in half through its entillength making it an easy matter to study every work



The Garford Line, Displayed by the Garford Company, Elyria, 0., Includes a Number of Features of Merit.

part. To facilitate examination hollow exteriors we been finished in red, which offers a splendid attract with the gray of the interiors.

The Inter-State Automobile Company has the first ace at the right of the entrance to Exhibition Hall. To new chassis, a 40 and a 50, replace the models of the year, and the four cylinders are cast en bloc interest of in pairs. Several details of refinement are be noted throughout the construction, including a rail gear driven oil pump provided with a distributional gear which supplies each bearing through an alependent lead. An added seven-passenger body interest the line. A distinct feature of the exhibit is a Aplco self-starting and lighting system.

Next to this is the Simplex Motor Car Company, shawaka, Ind., with the two-cycle valveless and ankless Amplex. The self-starting feature remains actically unchanged. A new Baby Amplex is soon

The Cartercar Company, Pontiac, Mich., has the last display space in Exhibition Hall. The friction driven Cartercar is fitted with a large number of body styles. Most of the latter are of the fore door, straight line type with door handles and hinges concealed, and control levers on the inside. Even the horn is located under the hood and the bulb is arranged in an accessible place within the body. The Cartercar also has a self-starter.

At the head of the stairway leading to the elevated platform from the front of the main hall is the space of the Nordyke & Marmon Company, Indianapolis, Ind. The Marmon Wasp, driven by Ray Harroun to win the 500-mile international race on Memorial Day, is shown elsewhere in the building, but the trophies won by Marmon cars occupy a prominent place in this display. The line is replete with minor improvements, among which may be noted the fitting



The Brush Runabout Company, Detroit, Is Featuring the Liberty Brush, Mounted on Revolving Platform.

be placed upon the market, deliveries being promsed for May.

The display of the Mercer Automobile Company, renton, N. J., is made more attractive by the presence f several trophies won during the past year, including the Kane County and Savannah Challenge cups. The new raceabout is modelled on the lines of the car which Hughes was a victor in numerous events in 911.

The Simplex Automobile Company, New York City, as the next space with the Simplex. Here is to be een one of the very few chain driven pleasure car nodels now being shown. The changes in the 1912 ine are largely matters of refinement.

The next to the last space, in the centre of the all, is that of the J. I. Case Threshing Machine Comany, with the Case line. This includes a new Greater lase 40, among the body types for which are a fivenessenger touring and a roadster. The Case car also presents a self-starting device, for which it is claimed that it has been tested out under all sorts of weather and working conditions and to have given excellent atisfaction.

of a two-spark Bosch ignition system.

Next to the Marmon is the display of the E. R. Thomas Motor Car Company, Buffalo, N. Y. The one six-cylinder Thomas chassis is continued, with several minor changes. Chief among these is the complete new system of lubrication for the motor, which has meant redesigning of the base of the crankcase, in order to make room for the oil reservoir with 3.75 gallons capacity.

Of chief interest at the space of the American Locomotive Company is the new Alco Berline limousine, with marine windows in the rear, enabling the chauffeur to see what is approaching from that direction. The arrangement of concealed electric lights which illuminate the steps at night also is of importance. This is the only change in the line.

The Everitt line, made by the Metzger Motor Car Company, Detroit, presents another en bloc six-cylinder casting. Several features of refinement are to be noted in the method of construction, and not the least of these is the provision for the removal of the floor board to permit access to the grease cups on the torque tube yoke, which is pivoted on hardened and ground



Special Showing of Columbia-Knight Motor, Made by Columbia Motor Car Company, Hartford, Conn.

pins operating in bronze bushings. The gasoline tank is rendered removable and provided with a three-way valve governing the line to the reserve supply.

The two-cycle motor on the Elmore, made by the Elmore Manufacturing Company, Clyde, O., has been redesigned to a certain extent, although the same cylinder dimensions and general arrangement are retained. All levers are inside the body this year and the equipment has been changed slightly.

While the American underslung line of the American Motors Company, Indianapolis, Ind., remains practically unchanged in mechanical features for the coming year, four new models have been added. The same principle of carrying the frame underneath the axle and the same large wheels are to be noted. One detail of refinement which will be appreciated in warm weather is the fitting of ventilators in the dash, underneath indentations for bullet headlights.

The Moline Automobile Company, East Moline, Ill., does not appear to have made decided change in its models for the coming year. The chief departure is an increase in the size of the water circulating pipes and in the substitution of a flat tube radiator for the vertical round type.

The show scene of the Premier Motor Manufacturing Company, Indianapolis, Ind., is taken from the ocean-to-ocean tour of Premier cars. Of the four machines on exhibit two and the chassis are finished in old Roman gold. A new design is termed the touring de luxe, and is a direct result of the above named tour. This is a six-cylinder chassis with convertible body.

The Selden Motor Car Company, Rochester, N. Y., shows but one chassis design, to which is fitted five body styles. Three of these are on display. Every arrangement has been made with a view to comfort and easy riding qualities. On the enclosed models spe-

cial electric lighting systems are provided.

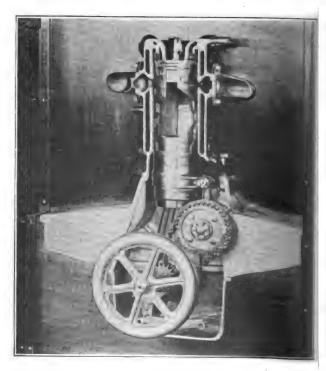
Space 110 is occupied by the Columbia Motor Car Company, Hartford, Conn. Here again the Knight metor is the one principal feature. Other new types are offered, but the greatest amount of interest attaches to this. The motor is shown in a special cabinet, with interior so cut out as to make it an easy matter is study its operation.

Next to the Columbia is the Jackson, made by for Jackson Automobile Company, Jackson, Michleader is the 50 horsepower model, although five ferent body designs are shown on three chassis. Characteristic Jackson features are retained, changes being in the matter of body design.

One of the features of the display made by the Brush Runabout Company, Detroit, is the Liberty Brush, finished in lavender, mounted on a revolving platform, which calls attention to the model as some as the visitor reaches this floor. This is not a new car, having been introduced to the public Independence Day, but it is the first time it has been seen at any show.

The Haynes Automobile Company, Kokomo, Ind. presents two models of the Haynes car, one of which remains without material change. The new design shows a tendency toward the long stroke motor, and the tire size has been increased by two inches. The radiator has been carried slightly lower, making it possible to drop the body slightly and providing a lower centre of gravity. Other decided changes are also to be noted.

The Buckeye Manufacturing Company displays another friction driven car in the Lambert, which presents very little change over former years, the principles of the design having been accepted as thoroughly satisfactory in every respect. The chief features have to



Stoddard-Knight Engine in Exhibition Case at Booth of Dayton Motor Car Company, Dayton, O.





The Coes Wrench Company, Worcester, Mass., Has a Most Complete Line of Coes Wrenches on Exhibit.

do with refinement of detail and the provision for comfort.

The Pullman Motor Car Company, York, Penn., presents three new models of the Pullman, one of which is a six-cylinder. An Ever Ready self-starter is provided, as well as an electric lighting system, and for 1912 the car comes fully equipped in every respect.

The Corbin Motor Vehicle Corporation, New Britain, Conn., offers but little change in the 1912 Corbin. The exhibit is replete with Corbin features, and such refinements in detail as will make for the comfort of occupants and operator.

The Moon Motor Car Company, St. Louis, Mo., is showing the new model Moon, which was brought out early in the fall. It contains all the modern features, including the Disco self-starting device.

The National Motor Vehicle Company, Indianapolis, Ind., not only presents a full line of National cars, but the machines which have helped to make this product

so well known in contest work during the past year also are on display. One of these is the car driven by Zengel to take the Elgin National trophy in the stock chassis events of last August. A new chassis is offered with a true long stroke, although the other mechanical details do not differ radically from the better known National products. The line also presents a self-starter.

The chief interest attaching to the display of the Matheson Automobile Company, Wilkesbarre, Penn., is the new Matheson "Silent Six" to which very attractive body forms are fitted, one of them being the product of Rothschild. Special emphasis is laid upon the new six-cylinder torpedo.

The Knox Automobile Company, Springfield, Mass., has on display a line of Knox cars which seems to offer little to be desired in the matter of comfort and beauty. A particular feature is the new tire carrying case, slung under the rear of the car. More room



The Stand of the Hartford Suspension Company, Jersey City, N. J., Presents a Number of New Accessories.



View of the Neat and Imposing Exhibit of Firestone Tires, Made by Firestone Tire & Rubber Company, Akrom, O.

is provided for passengers in the interior of the tonmeau, by the removal of all fittings to more accessible places. As already has been announced a longer stroke motor is offered in six-cylinder form for those who desire it.

Going up still another floor, the first exhibit on the right is that of the Garford Company, Elyria, O., including two new Garford models. One of these is a six-cylinder machine rated at 50 horsepower, and the other a four-cylinder, 34 horsepower. The new six has cylinders cast in threes and a number of other distinctive features. A polished chassis brings out all these details in a satisfactory manner.

The Ohio Motor Car Company, Cincinnati, O., presents the Ohio gasoline car in a variety of models. One of the characteristic features is a combined motor, clutch and gearset, by which power is transmitted from

a propeller shaft with two universal joints to a floating rear axle.

The Speedwell Motor Car Company, Dayton, O., is featuring the Speedwell seven-passenger fore door touring model. All Speedwell bodies are made of metal and are designed with the idea of giving plenty of room for the driver as well as the occupants of the tonneau. One chassis is used for all bodies, and the changes are mainly those of detailed refinements.

The Marquette, shown by the Marquette Motor Car Company, Saginaw, Mich., is the result of the consolidation of the Rainier and Welch-Detroit interests. Two models are shown, one being the old Welch-Detroit with new body types and more complete equipment, while the other is a new design throughout. Only one body is fitted to this chassis, that being a seven-passenger touring.



The Somewhat Pretentious Showing of Flak Tires, Made by the Flak Rubber Company, Chicopee Falls, Mass,



The Republic Rubber Company, Youngstown, O., Displays Republic Tires and Tubes in an Attractive Manner.

The Palmer & Singer Manufacturing Company, Long Island City, N. Y., presents a new six-cylinder Palmer-Singer which has a number of features not found in the older designs by this company. The old six-cylinder 40 horsepower car has been increased in power to 50.

The Atlas Motor Car Company, Springfield, Mass., while continuing the two-cycle Atlas, has adopted the Knight motor and the new model is full of features not heretofore seen on Atlas cars. Among these may be mentioned a worm drive and an electric self-starter. Of course electric lights also are provided. In fact, the Atlas line marks one of the most notable changes in the entire show.

Among the electric cars to be seen are the follow-

ing: Baker, made by the Baker Motor Vehicle Company, Cleveland, O.; Detroit, Anderson Electric Car Company, Detroit; Waverley, Waverley Company, Indianapolis, Ind.; Flanders, Flanders Manufacturing Company, Pontiac, Mich., and Grinnell, Grinnell Electric Automobile Company, Detroit. Each of these presents special refinements, and the Flanders and Grinnell are somewhat new to New York shows.

Space does not permit giving full details of the various models shown. Complete specifications and other data of all machines at both the Madison Square Garden and Grand Central Palace will be found in the next issue of The Automobile Journal, as well as similar information concerning the displays made in the sections allotted to accessories and motorcycles.



Display of Emblem Mounts, Made by the Emblem Manufacturing Company, Angola, N. Y., Is One of the Features of the Motorcycle Section.



January, 1912.

(New York Shows)

Jan. 10-17-N. A. A. M., Grand Central Palace. Jan. 15-20—Commercial cars, Madison Square Garden.

Jan. 8-13-Show, Peoria, Ill.

Jan. 13-19—Show, Milwaukee, Wis. Jan. 13-20—Pleasure car show, Philadelphia, Penn.

Jan. 15-20-Show, Toledo, O.

Jan. 15-20—Show, St. Paul, Minn.

Jan. 18-20—Annual meeting S. A. E., New York.

Jan. 22-27—Commercial car show, Philadelphia, Penn.

Jan. 22-27—Show, Detroit, Mich.

Jan. 22-27—Show, Rochester, N. Y.

Jan. 22-27—Show, Dubuque, Ia.

Jan. 22-28-Show, Providence, R. I.

Jan. 27-Feb. 3—Pleasure car show, Chicago, Ill.

Jan. 27-Feb. 3-Pleasure car show, Pittsburg, Penn.

Jan. 29-Feb. 3-Show, Scranton, Penn.

Jan. 29-Feb. 3—Dealers' show, Minneapolis, Minn.

Jan. 29-Feb. 3-Show, Montgomery, Ala.

February.

Feb. 1- 7-Show, Washington, D. C.

Feb. 3-10-National show, Montreal, Can.

Feb. 3-10-Show, Harrisburg, Penn.

Feb. 5-10—Commercial car show, Chicago, Ill.

Feb. 5-10-Commercial car show, Pittsburg, Penn.

Feb. 5-10-Pleasure car show, St. Louis, Mo.

Feb. 5-10—Show, Buffalo, N. Y.

Feb. 10-17—Show, Atlanta, Ga.

Feb. 12-17—Commercial car show, St. Louis, Mo.

Feb. 12-17—Show, Memphis, Tenn.

Feb. 12-17—Show, Ottawa, Can.

Feb. 12-17—Show, Fall River, Mass. Feb. 12-17—Show, Kansas City, Mo. Feb. 12-19—Show, Dayton, O.

Feb. 14-17-Show, Grand Rapids, Mich.

Feb. 17-24—Exposition show, Pittsburg, Penn.

Feb. 17-24—Association show, Minneapolis, Minn.

Feb. 17-24-Show, Newark, N. J.

Feb. 17-24—Show, Cleveland, O.

Feb. 19-24—Show, Omaha, Neb.

Feb. 19-24—Show, Hartford, Conn.

Feb. 19-24—Show, Cincinnati, O.

Feb. 20-24—Show, Binghamton, N. Y.

Feb. 20-28-Show, Baltimore, Md.

Feb. 21-24—Show, Louisville, Ky.

Feb. 21-28-Show, Toronto, Can.

Feb. 24-March 2-Show, Brooklyn, N. Y.

Feb. 26-March 2-Show, Paterson, N. J.

Feb. 26-March 2-Show, Elmira, N. Y.

Feb. 28-March 2-Show, Davenport, Ia.

March 2-9 —Show, Norfolk, Va.

March 2-9 —Pleasure car show, Boston, Mass.

March 4-9 —Show, Des Moines, Ia.

March 4-10-Show, Denver, Col.

March 6-9 -Show, Tiffin, O.

March 12-16-Show, Syracuse, N. Y.

March 13-20—Commercial car show, Boston, Mass.

NEBRASKA CLUB HOLDS ELECTION.

The first annual meeting of the West Point Aut mobile Association, West Point, Neb., which embrace that city and vicinity, was held Dec. 24, the election of officers resulting as follows: President, O. (Anderson, West Point; vice presidents, C. C. Stab West Point; F. F. Wurtman, Sherman; J. C. McNis Wisner; W. W. Troxwell, Bancroft; A. L. Loewe, El horn; secretary and treasurer, W. T. Fried, Deemer.

DOUBLES FACTORY CAPACITY.

Knell & Adams, body finishers, Detroit, has a quired the property of Burnham, Stoepel & Co., 1039-43 Jefferson avenue, which includes a two-stor factory that is to be remodelled, affording an increase of about 100 per cent. production. The company wi continue the use of the old factory.

REGAL TO MAKE DELIVERY WAGONS.

The Regal Motor Car Company, Detroit, has b gun the manufacture of light open and enclosed e press bodies which it is installing on chassis simile to those for pleasure car bodies. These vehicles at intended for fast commercial service rather than fo carrying heavy loads.

WILL BUILD MOGUL TRACTORS.

The Mogul Motor Truck Company has been or ganized at Chicago to engage in a general business of manufacturing and selling power vehicles. The com-The inpany has a capital of \$125,000 authorized. corporators are John P. Hicks, Frank Dawson, George Griffith and L. S. Jones.

FORD PRODUCTION DOUBLED.

The production of the Ford Motor Company, Detroit, is claimed as being 100 per cent. more for a recent month than for the corresponding month of last year, about 4000 cars having been shipped during the period.

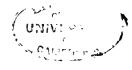
TO PRODUCE ACCESSORIES.

Automobile accessories will be produced by the National Spring Tire Company, incorporated at Elgin by C. H. Jackson, L. Valence and C. L. Siggman, Jr., all of Chicago, with capital of \$125,000.

WILL REMOVE PLANT TO DETROIT.

The Hoskins Manufacturing Company, Detroit, has purchased the business and equipment of the International Electric Motor Company, Chicago, Ill., and has removed it to Detroit, where the production of electrical specialties will be continued.





The Buyers' Number

The Automobile Journal

ISSUE OF JANUARY 25TH

WILL CONTAIN

Complete and Revised Specifications of all the pleasure and commercial vehicles manufactured in America, with illustrations of all the standard models, making a practical buying guide for the 1912 season.

Full review of Madison Square Garden and Grand Central Palace Displays, including detailed description of all cars, motorcycles, accessories, parts, supplies and fittings shown at these exhibitions.

Comprehensive advance information concerning the pleasure commercial and car shows at Chicago.

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FOREIGN CARS AT IMPORTERS' SALON.

Mechanical Details Outrank Luxurious Body Appointments for First Time in History of These Shows---New Motors Attract Widespread Interest.

V ISITORS to the Importers' Automobile Salon in the Hotel Astor, New York City, Jan. 2-10, were most interested in the different sleeve valve motors on display. Not only was the Knight well represented, being shown on Mercedes, English Daimler, Panhard and Minerva models, but no less than three other so-called silent engines were to be studied. Of course the matter of body design and trimming was not overlooked, since this has been a decided feature of foreign motor car exhibits for some years. However, it doubtless will not be denied that the bodies were forced to

had on display one of the first successful motor cars to operate on four wheels; indeed it was claimed to be the second machine built and the first to run over the streets of Manheim, Germany. It certainly offered a decided contrast with some of the handsomely bedecked machines on view at this show.

As was the case last year, the most sumptuously fitted car on exhibit was a Metallurgique, of Belgian make, styled the Louis XVI limousine. Certain it is that Louis XVI, or any other monarch, could not wish for the addition of any little detail of refinement. In-



General View of the Grand Ball Room of the Hotel Astor, New York City, During the Progress of the Annual Importers' Automobile Salon,

assume secondary importance in the consideration of the engine features.

The grand ball room of the Hotel Astor is admirably adapted for use as an automobile show space, very little in the nature of decorations being needed to permit the best disposal of the exhibits. While New York society people were quite as prominent among the visitors as in former years, it was significant that the initial showing of some of the foreign motors attracted a somewhat different class of visitors than usual. Attendants at the different booths were kept decidedly busy explaining the merits of mechanical construction, and it also was noticeable that cut-out motors and separate engines were on display this year.

In many respects the Importers' Salon had special educational value. The Benz Auto Import Company

side and out, it was a model of the coachmaker's art Incidentally not a little interest attached to the enclosed drive car of the Grahame-White type, by the same maker.

The Paul Lacroix Automobile Company had the largest exhibit in the show, presenting Clement-Bayard, English Daimler, Itala, Renault and Zedel cars. Most of these were fitted with bodies by A. T. Demarest & Co., and the whole made a most attractive display. As is well known the English Daimler is equipped with the Knight engine, but it is possible that the new Itala motor created quite as much interest, because it was shown for the first time in America.

Herewith is presented detailed drawings of this motor, illustrating fully the method of intake and



exhaust. The engine has four vertical cylinders, cast The ordinary four inlet and exhaust valve in pairs. spaces are replaced by two spaces, each containing a rotating piston which carries out the functions of distribution. This rotating piston, which is termed a distributor, is of simple design and is connected by a vertical rod to a shaft which takes the place of the two camshafts, its function being that of driving the magneto and water pump, as well as rotating the distributor. The interior of the distributor is in the form of two cones, the apices of which face each other, with slots so arranged as to register at proper intervals for the intake and exhaust.

Fig. 1 A presents the intake stroke, but in considering the drawing it should be remembered that each distributor serves two cylinders. The cross section at the top indicates the position of the slots in the distributor for the admission of gas, which in this instance takes the path under the bridge formed by the

the other of 35-45, were seen at the booth of the Renault Freres Selling Branch. In addition to these there were six complete cars, all with bodies by Kellner of Paris. These were specially prepared show cars and made a decidedly important display.

Ducasse & Co. presented the Charron and Darracq lines. The Charron is better known under the name of C. G. V., although it has been sold the past year under the new title. The Darracq was shown with the new Darracq-Henriod so-called valveless engine, this being the first appearance of this motor in America. In fact, it may be said that the Darracq was the only car in the exhibit, except those equipped with Knight engines, which showed the new type of motor mounted in the machine.

In this the rotating distributing sleeve is hollow and is located along the side of the engine near the top of the cylinder, where it is claimed that the problem of cooling and oiling is greatly simplified. By ex-

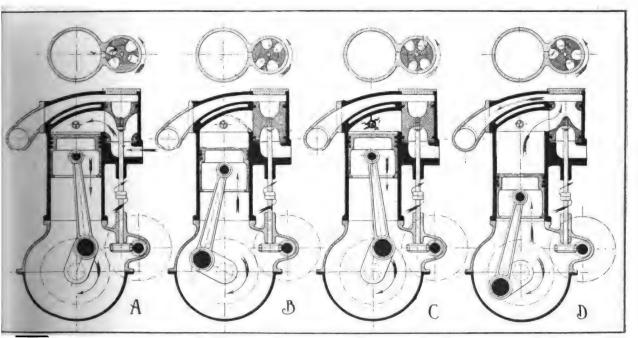


Fig. 1—Hilustrating the Various Functions of the Revolving Distributor on the New Itala Motor, First Shown at the Olympia in London.

combined apices of the two cones. When cylinder No. 1, for instance, is intaking, cylinder No. 2 is exhausting, depending on the order of firing.

Fig. 1 B shows the compression stroke and C the explosion. D indicates the position of the distributor and the registering slots at the time of exhausting, and in this case the burnt products escape over the bridge before mentioned.

The Piccard-Pictet Motor Company of New York City exhibited the Piccard-Pictet car, made in Switzerland, although the name has been shortened to Pic-Pic for American sales. This car is equipped with a so-called valveless motor with one sleeve, made under the Argyll patents. Inasmuch as The Automobile Journal gave a very complete description of this engine in connection with its review of the recent Olympia show in London, it will not be necessary to repeat it here.

Two polished chassis, one of 20-40 horsepower and

amination of Fig. 2, on the next page, the various functions are made clear.

That at the right indicates the intake stroke, when the revolving distributor has reached a point where the slot registers with the port in the side of the cylinder. The piston has moved downward from the beginning of the stroke and will continue in this direction until it reaches a point indicated next, which depicts the beginning of the compression stroke. The third shows the position of the members at the time of firing, while the last presents that of the piston and distributor at the time of exhaust. It is believed that a careful study of the sketch will be sufficient to explain the working of the device.

The Fiat Automobile Company presented a number of body designs, included among which was the new six-cylinder machine. Inasmuch as this was the first time this had been seen in America, the details of construction were studied with considerable interest.

Among the other cars on display were: De Dion-Bouton, Isotta, Napier, Panhard and Opel, all of which were presented with bodies of special design, the product of both American and foreign constructors. Holbrook & Co., and J. M. Quinby & Co., also had attractive displays of body work, in addition to those which appeared on the various chassis in the show.

IDEAL GASOLINE TANKS AND PUMPS.

Gasoline is not only highly explosive but evaporates very rapidly, and unless stored properly there is a loss of the fluid and a corresponding increase of the cost per gallon utilized. To obtain the best results the fuel should be placed in tanks and buried in the ground and the container connected by piping to the point of service. The Ideal Oil Pump & Tank Company, Boston, Mass., New England distributor for the Kupferle Bros. Manufacturing Company, St. Louis, Mo., maker of the Ideal equipments, markets a

locking device which makes it impossible for anyon to operate the pump without adjustment. This locking feature can be relocked by a separate attachmen on the outside of the pump.

PRESENTS GLIDDEN TROPHY.

The Glidden trophy, which was won by Maxwel cars in the 1911 tour from New York City to Jack sonville, Fla., was formally presented to Benjami Briscoe, president of the United States Motor Company, the parent organization of the Maxwell-Brisco Motor Company, by Charles J. Glidden, donor of the trophy, at a luncheon held in New York City recently Mr. Glidden in making the presentation speech is lated the history of the trophy and Mr. Briscoe is sponded suitably. A. G. Batchelder, chairman of the executive committee of the American Automobile Association presided as toastmaster. Among the man

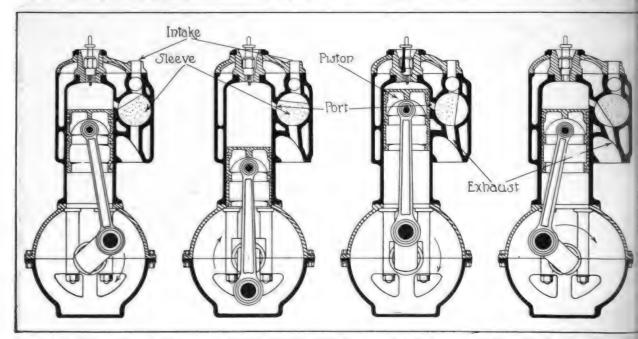


Fig. 2-Presenting Working Details of the Darracq-Henrold Rotating Sleeve Engine, Seen Mounted in the Darrace Cars at the Salon.

number of these devices which are made in different styles to meet the requirements of the purchaser.

All tanks are made of heavy galvanized sheet steel, painted with three coats of mineral paint, and are rust proof. They are equipped with a double heavy metal filler tube, the lower end of which is enclosed in a fine mesh screen and rests in the bottom of the tank. The top of the tube is equipped with brass wire screen for straining and a removable vented cap that may be locked also is fitted.

The Ideal pumps, which raise the fluid from the container, are of the combination force and suction type, constructed entirely of metal and so arranged that a gallon, half a gallon, quart or pint may be drawn accurately at each stroke. All are equipped with double brass valve and stuffing boxes of similar metal, automatic checks, anti-drip nozzles, lever shutoffs, 10-gallon discharge registers and a special self-

present were: Berry Rockwell and Alfred Reeves United States Motor Company; William Schimps chairman of the contest board of the A. A. A.; Mongomery Hallowell, A. S. Miles and Mortimer Reeves

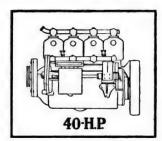
MINNEAPOLIS WANTS GLIDDEN TOUR.

The Automobile Club of Minneapolis, Minn., which running the Twin City-Helena tour of 1911 with such remarkable success, is particularly anxious to secure the Glidden tour for 1912. So much in earnest is the organization that a special committee, under the chairmanship of F. E. Murphy, has been appointed to take the matter up with the contest board of the American Automobile Association and local dealers. The route suggested is from Minneapolis to Northeans, touching prominent cities located in intervening territory.

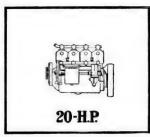
You Buy Specified Horsepower

DO YOU GET IT?

When you buy your automobile you buy a specified horsepower. Yet, the best automobile cannot deliver its power if poor lubricants are used.



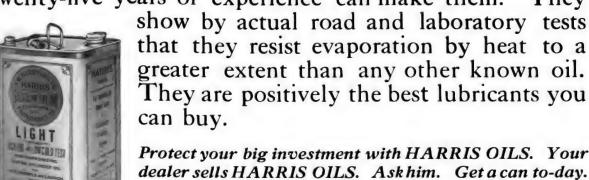
In some cases the horsepower is reduced one half because of soot-deposits on valves, cylinder heads, spark plugs, etc.—due to inferior oils—the car instead of being 40 H. P. actually delivers 20 H. P.



HARRIS

OILS

Are as free from the possibilities of soot-deposits as twenty-five years of experience can make them.



Protect your big investment with HARRIS OILS. Your dealer sells HARRIS OILS. Askhim. Get a can to-day.

A. W. HARRIS OIL COMPANY

326 So. Water St., PROVIDENCE, R. I.

143 No. Wabash Ave., CHICAGO, ILL.

TAMPA CLUB ELECTS OFFICIALS.

The Tampa Automobile Club, Tampa, Fla., held a meeting recently and nominated the following officers for the coming year: President, H. C. Macfarlane; vice president, M. E. Gillett; treasurer, L. L. Buchanan; secretary, W. B. Powell. The election of these officers will be a mere formality.

POSSIBLE PRESIDENTS IN NATIONAL.

One of the features of the recent visit of the western governors to Indianapolis, Ind., was an inspection of the motor speedway, where Howard Wilcox, Donald Herr and other racing pilots gave the statesmen some thrilling exhibitions of speed. Some of the executives were timid about riding in the racing machines, but gladly took advantage of the opportunity to use National touring cars, made by the National Motor Vehicle Company of that city.

An accompanying illustration shows some of the latest presidential possibilities in one of these machines. Gov. Marshall of Indiana occupies the front



Some Presidential Possibilities Enjoying a Ride in a National Car at Indianapolis, Ind.

seat beside the driver. Gov. Judson Harmon of Ohio is at the right of the rear seat, while Gov. Oswald West of Oregon is beside former Vice President Fairbanks.

COLE CLAIMS ECONOMY RECORD.

The Colt-Stratton Company, New York City, eastern distributor for Cole cars, made by the Cole Motor Car Company, Indianapolis, Ind., claims a new fuel economy record, made by S. J. Colton of Johnstown, N. Y., recently. This machine ran 3123 miles at an average speed of 24.75 miles for each gallon of gasoline, and 133.1 for each gallon of oil.

PLAN BIG BOSTON BLOCK.

Architects' plans have been formulated for the erection of a block of new buildings especially for automobile showrooms at Beacon street and Brookline avenue, Boston. Each unit in the block is 32 feet

wide, permitting stores 64 feet wide. Entrance the basement and second floor will be by means disclined planes, instead of elevators, although the latter will be provided for handling cars, etc.

FAIRMOUNT PARK RACE SANCTIONED.

Although Dr. J. William White of Philadelphia is still busily engaged in prosecuting his appeal to the park commission of that city against the practise of allowing road races to be run in Fairmount park, the Quaker City Motor Club, which has managed this even in the past, has asked for and obtained a sanction for the 1912 race. The contest board of the Americal Automobile Association has set the date for Oct. Sand plans will be laid accordingly.

UNITED STATES MOTOR OFFICIALS.

With one exception, that on the board of directors the incumbent officials of the United States Moto Company, New York City, were re-elected at the annual meeting held recently in Jersey City, N. J. J. W.

Stoddard was chosen to succeed H. J Edwards as a member of the board of The officers for the ensu directors. ing year are as follows: President Benjamin Briscoe; first vice president C. G. Stoddard; second vice president J. D. Maxwell; additional vice pres dents, Horace DeLisser, Frank Briscoe Alfred Reeves, J. W. Wellington; sec retary, F. D. Dorman; treasurer, Carl Tucker; assistant treasurer, J. M. Ed sall; directors, J. C. Brady, Benjamin Briscoe, Richard Irvin, Herbert Lloyd Edgar J. Meyer, J. D. Maxwell, Eugen-Meyer, Jr., O. J. Mulford, H. W. Nuck ols, R. A. Robertson, K. B. Schley, C. G. Stoddard, J. W. Stoddard, Frank

The report of the year ending July 31 showed net profits of \$2,040,256. President Briscoe stated that the outlook for 1912 was exceedingly bright and it is predicted that the business

will reach a gross figure of \$31,000,000 the present year.

CHICAGO ASKS FOR CONTEST DATES.

The contest programme of the Chicago Motor Club for 1912 includes no less than four events of national importance. Officials of the club have raked the contest board of the American Automobile Association for sanctions as follows: May 15-17, commercial vehicle trials; June 20, Algonquin hill climb; Aug. 16-17 Elgin national stock chassis races; Oct. 7-12, reliability run.

WILL HANDLE KING LINE.

Charles A. Malley of Boston has severed his connection with the company bearing his name and will become eastern district manager for the King Motor Car Company of Detroit, maker of King cars.



PROGRESS REVEALED IN SELF-STARTERS.

escription of Some of the Devices Offered in the Market, Illustrating Principles of Operation and Method of Attachment.

Part II.

O ATTEMPT was made in the previous discussion to include all of the many designs of self-starters, d this continuation of the subject is not intended as complete presentation. The situation is such at this ne, that it would be difficult to collect all of the rious models for satisfactory classification. It may regarded more in the nature of a transitory period, which many designers are seeking the most detable.

As was stated in the last issue of The Automobile urnal, the shows of last winter practically served bring this newest feature of motor car equipment pre forcibly to the attention of the public. Throught the past year inventors have been working along

iginal lines, which has resulted in e production of a long list of self-arters, some of which are still beg tested by the designers or by ose who are considering the adsability of their exploitation. any makers who are known to be gaged in this field still express emselves as not quite ready to ake public the result of their idings.

The display of self-starting deces at the New York shows now ing held will prove something of revelation to those who have not atched the progress of these fitags. The number of cars supplied ith something of this nature, as andard equipment has been growg rapidly within the past few seks. The self-starters exhibited

the various accessory booths are sufficient indicaon of the importance being attached to their proaction.

Continuing the description of individual products, is anticipated the reader is anxious to become more aversant with the different designs. Space does not that of taking up all of them in any one issue, and e presentation is wholly without regard to logical quence or other method of classification. The sole tight is that of supplying definite information containing the devices now being offered in the market.

The Apple Electric Company, Dayton, O., is makes shipments of its Aplco electric self-starting device, hich provides for four important functions—starting, niting, lighting and signalling. The system consists three units, a combined motor and dynamo, concoller and storage battery. The dynamo, as illusted at Fig. 11, is attached to the engine by means as ide shaft or through flexible gearing and flanged rockets, and may be applied to any available point ong the crankshaft ahead of the transmission. Confined in the head of this unit is the reducing gear

mechanism and clutches which are automatic in their action.

No part of the apparatus is placed on the dash of the car. The controller, which is claimed to be the vital unit of the system, is located on a panel in front of the driver's seat and contains the controlling switches for all the electrical appliances used on the car. The storage battery is a 12-cell unit arranged in four groups supplying six volts each. It can be located in a box in the floor of the tonneau or on the running board.

Pulling the small lever on the controller causes current to flow from the storage battery to the starting motor, which acts through the reducing gear to

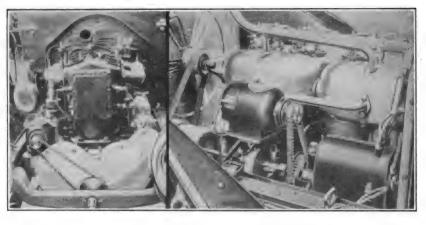


Fig. 11—Apico System for Self-Starting: At Left, Method of Attaching Dynamo on Stoddard-Dayton Cars; at Right, as Applied to the Chalmers.

turn the engine over at the rate of 40 to 60 revolutions a minute for a period of 40 minutes, if desired. As soon as the engine is running under its own power, the automatic clutch releases the reducing mechanism and the machine is driven as a dynamo at engine speed, furnishing the current for ignition, lighting and charging the battery. The apparatus is so arranged that it is held to be impossible to throw the starting mechanism into operation until the spark is retarded and the transmission is in a neutral position.

The frame of the Aplco dynamo is cast of a special electrical steel with solid bearing heads. This method is held to insure a perfect mechanical alignment of the bearings and to overcome the possibility of parts becoming loosened by vibration. The armature and commutator are made with 21 sections. The armature shaft is of steel, carefully ground to size and runs in the highest grade of ball bearings.

The brushes are self-lubricating and long lived. They are held in a brush holder apron of insulating material, and stand at an angle of 45 degrees to the vertical in order to avoid accumulation of dust, oil,



Fig. 12—Crescent Air System Fitted to Front of Car, Presenting Neat Appearance.

etc. A pressed steel door covers the commutator end of the machine, and this is so hinged that it may be opened in either direction, affording easy access to the brushes and electrical connections.

The Crescent Air System Company, Detroit, supplies a compressed air method of self-starting, which is manufactured in two designs. The first comprises a double-opposed cylinder compressor and air crank combined in one machine, which can be attached readily to cars already constructed. The other has a two-cylinder vertical compressor cast en bloc, suitable for mounting on the engine or in the transmission case. Fig. 12 shows the first design attached to a high powered car.

The particular feature of this system is the air crank, the detailed construction of which is outlined at Fig. 13. This consists of a metal frame attached just in front of the radiator. Mounted on this is a brass tube or cylinder bent to a half-circle or cres-

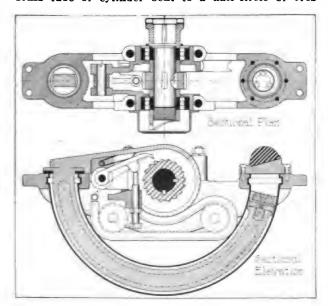


Fig. 13—Detailed Construction of Crescent Air Crank, Illustrated by Cross Section Drawings,

cent. In it is a curved piston rod with a piston of one end and the other end attached to an arm of crank fulcrumed on a hollow shaft through which the engine shaft is operated, the hand crank being removed.

On the arm or crank is a pawl designed to engage and turn a ratchet on the engine shaft. When a charg of compressed air is admitted to the tube, the pistor and crank are forced over a half-circle, the paw turning the ratchet and thus cranking the engine.

The compressor is attached to the frame of the air crank and immediately in front of it. The engine shaft extending through the air crank to the compressor may be attached to the compressor crankshaft by a clutch at the will of the driver and from his sea in the car. When so connected, the engine operate the compressor, which forces air from the atmosphere through a small pipe into a tank under the car. The compressor is air-cooled by a series of fin on each cylinder, and requires so little power, it is claimed to be customary to operate it only from

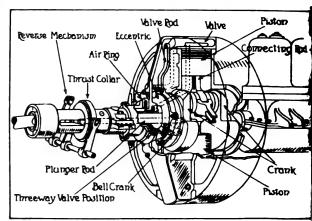


Fig. 14—Prather Pneumatic Clutch Construction Storing and Utilising Compressed Air.

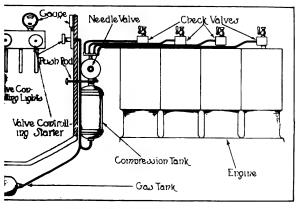
time to time when the car is in motion. The normal pressure is 250 pounds.

In addition to the self-starting feature of the system, it is said to have a wide variety of uses, in-asmuch as it is possible to utilize the air stored in the tank for inflating tires, dusting off the car, etc. The starter is operated by a foot button on the dash.

The Prather pneumatic clutch is the name applied to the device brought out by the Pneumatic Clutch Motor Company, Los Angeles, Cal. The purposes for which this equipment was designed include a number of features, in some of which the crank outlined in the accompanying drawing, Fig. 14, must revolve to the right and in others to the left. Reversal of rotation is accomplished through the medium of the reverse mechanism, plunger rod and bell crank, operated by a pedal located in proximity to the brake pedal in the floor of the car. When this is pushed forward the eccentric is shifted in relation to the driving shaft and the position of the valves is changed. and consequently the admission and discharge of air into and from the cylinders in relation to the position of the crank. This mechanism is held to effect the same purpose and the change of position in the valves is said to be identical with the method employed in the reversal of steam engines.

Air is compressed by being taken through the ine pipe into the cylinders on each up-stroke of the
tons and discharged through a three-way valve into
ressure tank at the rear of the car. When drawn
on, the supply in this tank is replenished automaticy, as the device, when operating as a clutch, builds
sufficient pressure to lock the parts each time the
chine is started. The stored air, however, is held in
tank by a check valve and has no escapement ext at the will of the operator. Therefore, it is
allable at all times for self-starting, inflating tires,
wing horn, supplying pressure for gasoline tank,

The self-starting feature is brought about by spining the flywheel. When used as an air compressor is member is turned to the left. If air under presere were readmitted into the piston cylinders, the carnaining still, the flywheel would be spun to the fit, which would not start the engine. Therefore, it is desired to turn the engine over, the reverse dal is pushed forward and a control lever mounted the steering wheel is thrown up to admit air from pressure tank, which spins the flywheel in the same section it was turning while compressing the air.



;. 15—American Self-Starter Utilises Acetylene Gas Distributed from Controller on the Dash,

In considering the operation of this device it must borne in mind that the flywheel may revolve free-as well as the crank outlined in the sketch and e driving shaft of the machine of which it is a part. It is must be remembered that the flywheel may be led stationary, and with the car in motion, the driving shaft and the crank above mentioned may revolve sely.

As already stated, the device has a number of nctions, in the performance of which a study of its schanism would prove very interesting. Superior vantages are claimed for this type of clutch and its ethod of operation in bringing about air braking, tarding effects, variable speed control, etc., the self-arting feature being more or less incidental.

The American Starter & Carburetor Company, 122 South 40th avenue, Chicago, is producing the merican acetylene gas starter depicted at Fig. 15. this, acetylene is led from the regulation tank to a attroller on the dash, whence it is taken to an auxary or compression tank by one pipe and by another pe to the lights.

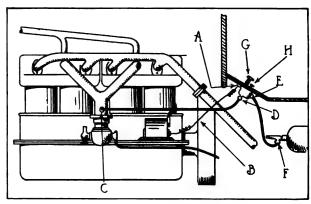


Fig. 16—Maciaren Acetylene Device, Presenting Connections to Magneto and Carburetor,

To start the engine, the operator turns on the valve to the compression tank, until pressure on the gauge indicates 30 pounds. Then he touches the pushrod with the foot which allows gas to go through the needle valve to the pipes leading to the cylinders, and turns on the spark. The check valves, through which the pipes are introduced into the cylinders, insure perfect compression in these members. The engine may be started with a pressure of only five pounds by putting in several charges.

Another acetylene device is the Maclaren, made by the Maclaren Company, 172 Ionia street, Grand Rapids, Mich. This connects from the Prest-O-Lite tank to the intake pipe by .125-inch pipe fittings, and fastens on the bottom of the footboard. Through this board projects a small button, by pressing down on which the motor is stopped. This action automatically turns off the electric current and allows a very small portion of acetylene to be drawn in and equally distributed to all of the cylinders during the last few revolutions of the motor. When ready to start, the switch is turned on, and the button on the coil is operated, or the spark lever is retarded, until contact is made, producing an explosion in the proper cylinder.



Fig. 17—lilustrating Appearance and Operation of Shur-Go Apparatus, Employing Mixture of Gasoline and Air.

In explanation of the accompanying drawing, Fig. 16: A is the insulated contact of the starter, used to short circuit the magneto when stopping motor. B is

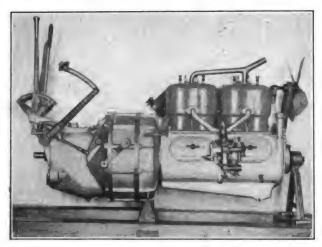


Fig. 18—Method of Connecting Gardner Starter and Its Relation to Engine and Other Parts.

the wire running from A to the magneto. C is the point for connecting gas pipe to intake manifold just above the carburetor; D, the pipe connection on the starter from C; E, that connecting starter to tank connection; F, where a two-way valve is located for regulating use of the lights; G, button to be pushed by the foot when stopping the motor, and H, the needle valve employed to regulate the amount of gas taken from tank.

A device utilizing a mixture of gasoline and air is the Shur-Go, manufactured by the Motor Starting Company, 427 North Meridian street, Indianapolis, Ind., and illustrated at Fig. 17. In this a pump forming a hand carburetor is placed in the footboard of the car and is connected with the regular gasoline tank. In pulling up the piston, the proper amount of fuel and air is drawn in, producing what is claimed to be a perfect mixture, which is compressed by the downward movement of the piston and forced into the distributor to the cylinder or cylinders in firing position. The mixture is ignited by the touch of the but-

ton on the coil box. A separate attachment is fitted, by means of which it is claimed that it is possible to start the engine even on dead centre.

A mechanically operated device, utilizing stored energy, is the Gardner, produced by the Gardner Engine Starter Company, Inc., Michigan avenue, Chicago, and presented above at Fig. 18. The principle is that of a compound-concentric spring always under high tension and using only one-quarter of a complete wind. No gears are employed as the spring is wound or unwound in the same direction.

The brake drum containing the spring is mounted on the drive shaft, preferably between the engine and transmission, and the stored energy is secured from the momentum of the car through the rear axle appropeller shaft. A pedal pushed through the toebus releases the spring and opens a gasoline priming was The engine whirls at normal speed before ignitional speed before ignit

A device operated by foot lever is the Wilkins placed in the market by the Brown & Murray Copany, Detroit, and shown at Fig. 19. It consists opedal connected by links to a bell crank arm, the of which when the pedal is depressed engages suprojecting from the face of the flywheel near its of this throws the engine over.

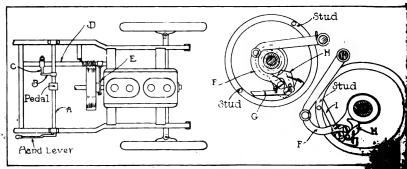
Referring to the sketch: By pressing forward of pedal or operating the hand lever, the shaft A turned so as to actuate members B and C, imparts motion to the shaft D, which lifts the arm E in front of the flywheel. This engages link F, it being on nected with driving member G by a crankpin which causes the oscillating arm H to swing forward a force a thrusting contact by shoulder I against stud, which is inserted in the arm of the flywheel thereby rotating the engine crankshaft fully 1800 grees, compressing one cylinder and passing the nition point each time the lever is operated.

MAIS TO EXHIBIT AT NEW YORK.

Will H. Brown, president and general manager the Mais Motor Truck Company, Indianapolis, Indianapoli

LIGHT BILL IN RHODE ISLAND.

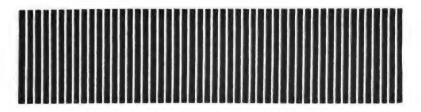
A bill compelling all vehicles utilizing the his ways to carry lights at night, will be introduced the General Assembly of Rhode Island during its prent session by a Providence senator. The act is silar to that in force in Massachusetts and provis



complete wind. No gears are employed as the spring is wound or ployed as the spring is wound or properties as the spring is wound or spring is wo

is made for eliminating horse drawn vehicles operatin sections where the streets are lighted and tamps a stated distance apart.







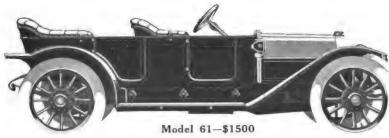


LL of the standard popular priced cars are represented in this issue. This gives you a splendid opportunity to make a few comparisons of motor car values and to verify our claims, that in an Overland car you get more real car for less money than in any other machine on the market.

¶ For example—take our Model 61. This car has a big 45 horsepower motor. Is a five-passenger touring car. The wheel base is one hundred and fifteen inches. The axles are fitted with the finest Timken bearings. The transmission is fitted with F & S annular bearings. The pressed steel frame has a double drop. The handsome body is finished in rich Brewster green trimmed with heavy nickel plate. The lamps are dead black and nickel plated. The magneto is a Bosch. This car is priced at \$1500. Have you ever seen its equal for less than \$2000?

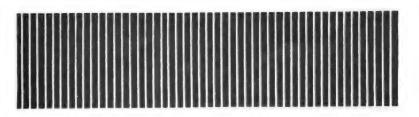
¶ Our interesting factory book explains why the greatest organization in the business can make these fine cars to sell at such remarkably low prices. Write for a copy. Please ask for copy K41.

The Willys-Overland Company, Toledo, Ohio.



Wheel base, 115 inches; body, 5-passenger fore door touring; motor 4 3-8 x 4 1-2; horsepower, 45; Bosch magneto; tires, 34x4 inch. Q. D.







NEW AND NOVEL ACCESSORIES THAT APPEAL TO MOTORISTS.

The Vanometer is a new form of a fuel gauge fitted to the dash where the operator may note at a glance the amount of liquid in the tank, and is manufactured by the Van Auken Indicator Company of 123 Liberty street, New York City. The device is operated by liquid balance and is connected to the tank by a tube. A coil of copper tubing, which is adjustable, is inverted in the top of the container and extends to the bottom. The fluid in the Vanometer, which is .5 inch wide and 3.5 inches high, is red, being a special chemical compound of certain specific gravity and will withstand a temperature of 20 degrees below zero, Fahrenheit. The tube connecting the indicator and tank contains air which rises and falls according to the amount of gasoline in the latter. This raises or lowers the colored fluid, and it is claimed that its registration is not affected by grades. It is attached easily, and having no mechanism to get out of order, is durable.

The Spark Plug Pump, marketed by the Mayo Manufacturing Company, Chicago, is a new form of tire inflator which is operated by the motor. It is attached easily and quickly by removing a spark plug and inserting the member and it is claimed the operation may be performed with the hands. The pump is on the compound principle and utilizes pure air supplied by an intake valve and compounded to high pressure into the upper cylinder of the member and thence forced to the tire. When in use the engine is run at a low rate of speed, and it is said that a shoe may be inflated to 150 pounds pressure in a few minutes. All working parts are substantial and the piston is fitted with rings. Interchangeable connections make it adaptable for different sized spark plug openings.

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The Mondex Muffler presents interesting features inasmuch as it it claimed that it is self-cleaning, prevents back pressure and is compact and light in weight. It comprises three pipes of seamless tubing, connecting two expansion chambers, and the two outside



members, which run its entire length, are spanned over the heads at each end. The exhaust enters through the first tube and travels throughout the muffler. At one end of the tube is a series of perforations, the sum total of these being three times the diameter of the pipe. Passing through these openings, the gas enters the first expansion chamber, then through the centre tube to the second chamber, after which it expands through perforations in the third tube and a tail pipe into the open air. As the two chambers are exposed to the air, cooling is facilitated. The device is free from bolts, nuts, cups or baffle plates, the chambers being held together by steel bands shrunk into position. Inside the outer casings of the chamber is a layer of asbestos, which is encased with galvanized iron. It is made by the Aristo Company, New York City.

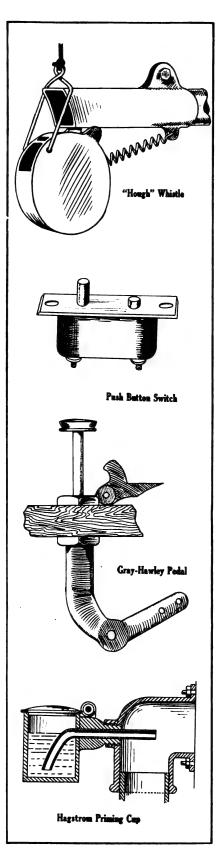
The Oatka Tire Remover is a neat, compact tool, designed for use on quick detachable rims. With it the removable flange may be forced back easily and the device locks automatically so that the lock ring may be displaced from its groove. Applied between the spokes of a wheel it may be utilized to remove the most stubborn shoe. The tool is reversible in its application and is made in two sizes. It is marketed by J. W. Grumiaux, Le Roy, N. Y.

The National Steam Vulcanizer is a handy vulcanizing outfit that may be carried in the tool kit of a motor car and is manufactured by the National Motor Supply Company, Cleveland, O. It is operated by steam which is favored in this work, and which is said to eliminate the danger of burning the rubber. The device is a hollow brass shell which is partially filled with water, and the fluid is heated by a wood alcohol lamp, It is adaptable to any sized tube or casing, requires but a few minutes to generate steam, and is fitted with a thermometer. It may be operated with the tire on the wheel.

The Hough Whistle is a new ype of warning signal designed specially for model T Ford autoaobiles and was invented by a aotorist in Providence, R. I. It roved so successful in practise hat the rights to manufacture the levice were acquired by the Auto mprovements Company of Bristol, R. I. It is attached easily and juickly to the end of the exhaust eading from the muffler by means of a tapered tube which is split at one end and locked by a threaded bolt and nut. The other end of this part is square and slightly concave so as to fit over and partially close the opening in the drum-shaped member. The latter is attached to the part on the exhaust pipe by two hinged extensions and a spring is fitted to keep the drum from moving upward except when the signal is desired. A link is connected to the drum and the former serves a double purpose, inasmuch as the wire leading to the operating pedal is attached to this link which also checks the downward movement of the drum. When the latter is in a neutral position, the flow of burnt gases is not obstructed as they pass freely over the drum, which is made of aluminum. The tone of the whistle is mellow and far reaching in its effect. The device is moderately priced.

Push Button Switches of the flush type are utilized in fitting electrical devices to the automobile with a limousine body, and a neat appliance of this kind is manufactured and marketed by Frank W. Morse, Boston. These are made with polished brass, nickel, old brass, gun metal and Bauer Barff finish, and are provided with interchangeable plates. The appliance is manufactured with single, two, three or four gangs.

The Gray-Hawley Pedal, manufactured by the Gray-Hawley Manufacturing Company, Detroit, well known maker of motor car accessories, is an adjustable device for operating the cut-out of the exhaust or signals and is actuated by the pressure of the foot. The appliance is fitted easily by boring a .75-inch hole in the footboard, through which opening the threaded part of the member



is passed and its upper end locked by a nut. The length of the part is such that different adjustments are possible by making use of the lower locking nut. The plunger rod which carries a flat head, moves easily through the stationary part and actuates a V shaped lever which is provided with two holes for the purpose of attaching the cable. The upper locking nut is fitted with a pawl member which engages with a recess in the head of the plunger when the latter is depressed. This permits locking of the pedal which is released easily by touching the member with the foot. The device isconstructed of the best grade malleable iron and polished brass. It is inexpensive and may be purchased without the locking attachment.

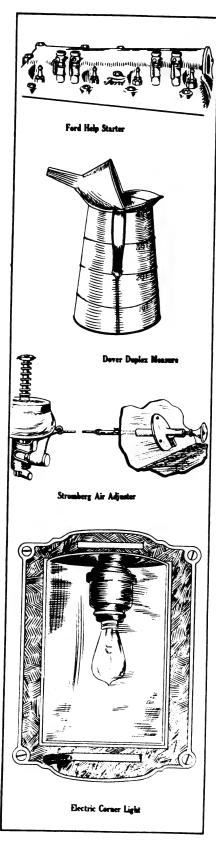
The Hagstrom Priming Cup is a departure from the ordinary form inasmuch as it is automatic in its operation. It consists of a brass vessel which is attached to the intake manifold or pipe by drilling and tapping a hole. The device for holding the gasoline is fitted with a hinged cover. utilize the primer, fuel is poured into the cup and the lid closed. The maker, Hagstrom Bros. Manufacturing Company, Lindsborg, Kan., claims that one turn of the starting crank will start the motor. A tube leads from the vessel into the intake pipe and the gasoline is drawn into the manifold by the suction of the piston on the intake stroke, and at the same time, it is said to convert the liquid into a vapor. Auxiliary air is prevented from being drawn in when the cup is empty by the lid which is machined to a perfect fit and held securely on its seat. The device contains enough fuel to operate the motor for some little time. In addition it is said that the primer may be utilized as a decarbonizer injector.

The Ford T Help Starter is a priming device fitted by the Home Light Company, Chicago, which concern is specially equipped for attaching priming cups to this type of motor car. In very cold weather when it is necessary to inject gasoline into the combustion chamber before the motor can be started, the spark plugs have

to be removed if the engine be not fitted with priming cups. The Ford T is not equipped with these devices, and the construction of the cylinder head, which is one piece, is such that extreme care is essential in boring this part. The company guarantees a gas and water tight job which necessitates the sending of the cylinder head to its plant.

The Dover Duplex Funnel is a new addition to the line produced by the Dover Stamping & Manufacturing Company, Cambridge, Mass. It is a combination measure and funnel and is fitted with a pouring lip with a centre channel, an appreciable feature when fast pouring is desired. For filling oilers or vessels having small openings a funnel is provided on the opposite side and the spout extends upward so that when the measure is set down the oil runs back into it instead of dripping outside. The handle is located on the side, facilitating work when the device is being operated in close quarters or cramped places. In addition the measure is graduated, each being marked, and these comprise pints and quarts. The line is manufactured of extra heavy material, copper plated, lacquered, and all seams are soldered and guaranteed not to leak. They are made in sizes ranging from one-half pint to four quarts capacity.

The Stromberg Dash Adjustment is the product of the Stromberg Motor Devices Company, Chicago, maker of the well known carburetor of that name, and is designed to be utilized in connection with the vaporizer. To obtain the best results from a carburetor the mixture should be perfect, and although adjustment may be made with the motor running idle, it is more advantageous to set the device when the engine is working under ordinary conditions. This usually requires two men, one to operate the car while the other adjusts the carburetor. The Stromberg appliance, which is made in several forms, is attached to the dash and is equipped with a plunger rod which extends to the vaporizer. By turning a knurled member the mixture may



be varied throughout, an appricable feature where atmospher and other conditions prevail.

Electric Corner Lights among the electrical noveltic adaptable to the automobile and these are manufactured and marketed by C. Cowles & Co., New Haven, Conn. The device is intended for the purpose of illuminating the interior of closed vehicles. It is fitted to the corner of the car and is controlled automatically by the lever which opens and locks the door. When the latter is opened the lamp is lighted and a revolving cover exposes the light. The latter is extinguished when the door is closed and locked. and the cover to the device closes. It is neat and attractive in appearance and the frame is made of polished brass, nickel, silver or gun metal, provided with a silver reflector. It is about five by 3.5 inches. When fitted to the limousine body the lamp lights up the interior, facilitating entrance and egress of the passengers. Many costly gowns have been ruined by mud splashing on the steps. With the corner light these are illumininated.

Wolf Head oil and greases. manufactured by the Wolverine Lubricants Company, 80 Broad street, New York City, include in addition to the regular lubricating fluids, Crystal oils which are utilized by aviators and owners of high priced motor cars and racing boats who desire an oil which. regardless of cost, will be entirely free from all carbon producing impurities. It is a pure Pennsylvania product which is filtered and refiltered until it is crystal clear; is of high gravity and flash point, and is made in light, medium and heavy grades. The company also produces a high grade of cylinder oil adapted to high speed motorcycles, as well as marine and gear lubricants. All cans and barrels are sealed when they leave the facory so that they reach the consumer in their original condition. The company also manufactures a non-flowing oil for transmissions and gears, which is recommended preference to grease and graphite for use in universal joints, etc.

—you are interested in electric lights—here are facts worthy of your consideration.

CORRECT DESIGN

The most important factor in the building of an electric system is correct design—a design conceived for the one purpose of automobile illumination. A converted train lighting system, or a system depending on the battery is obviously unsuitable. **GRAY & DAVIS** Dynamo is designed, developed and built for automobile use only.

KNOWING HOW

Knowing how! GRAY & DAVIS have been building automobile lighting equipment since the inception of the automobile. They understand every condition—every vagary—every angle of road and car illumination. It is their business and study. They have specialized and concentrated on this one thing. Hence—they "know how."

Write for catalog

GRAY & DAVIS

Manufacturers of AUTOMOBILE LAMPS

BOSTON, MASS.

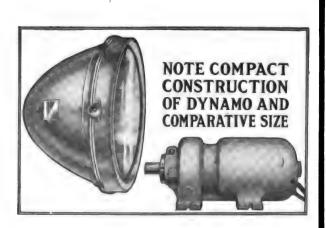
55 Lansdowne Street

EXPERIENCE

Experience is absolutely necessary—and the experience should be the result of years of study and actual road use. The GRAY & DAVIS Dynamo has been giving service for over FOUR YEARS. It was a veteran when the new and untried systems were still unthought of. We did the experimenting—not our owners.

ABSOLUTELY RELIABLE

Just as reliable as the Dynamo which furnishes current in your home or office. That is the GRAY & DAVIS Dynamo. It is driven by the motor and requires but 1-6 H. P. to operate it. It DOES NOT depend on the battery (an exclusive feature). The voltage will not vary and it lights lamps irrespective of running conditions. Beautifully built, in the largest factory of its kind in the world.



MOTORING NEWS OF NATIONAL IMPORT.

Display Space at Providence Nearly All Taken—Reports from Numerous Oth Show Centres---Engineers' Annual Meeting—Buffalo's Initial Exhibition----Road Convention Plans—Race Meets Projected.

M ANAGER Arthur S. Lee, in charge of the arrange-

ments for the annual show of

the Rhode Island Licensed

Automobile Dealers' Associa-

tion in the State Armory in

Providence, R. I., Jan. 22-28,

reports that but one space re-

mains untaken, and that he

has sufficient applicants for

that to supply a very respect-

able exhibition by themselves.

It has been three years since

the people of Rhode Island

have had opportunity to in-

spect the various models in a

show of their own, and it



A. S. Lee, Manager Providence Show.

would appear that the dealers were responding very generously.

Following along the lines laid down in the earlier days of the automobile show in this country, when those at Providence ranked well toward the head of the list in matter of general attractiveness, no effort will be spared to make the decorations at this year's exhibit something to be remembered. The interior of the armory will be transformed into a large palm garden, and thousands of electric lights will aid in bringing out the color scheme. The details of this arrangement are not to be made public until the display opens, but it may be taken for granted that the show committee has profited by the experience of others in managing exhibitions of this kind, and the setting will be quite in keeping with the importance of the event in the history of the industry in Rhode Island.

Among those who will display pleasure cars are: Foss-Hughes Motor Car Company, Pierce-Arrow; Speedwell Company, Speedwell; Higgins Motor Car Company, Stearns; Aetna Bottle & Stopper Company, Buick; Providence Motor Car Company, Stoddard-Dayton; Rhode Island Motor Car Company, Pope-Hartford; A. S. Lee, Corbin; C. H. Goodwin, Inter-State; William Hughes Company, Reo; Alvan T. Fuller, Packard; J. S. Harrington & Co., Everitt and Thomas; Mitchell Auto Company, Mitchell; Davis Automobile Company, Peerless, Winton, Lccomobile, Chalmers, Regal and Mercer; L. B. Lorimer, Hudson; John O'Donnell, Premier; Maxwell Sales Company, Maxwell; KisselKar Company, KisselKar; Hitchcock-Banks Motor Car Company, Knox; Cadillac Auto Company, Cadillac; White, Binford & Robinson Motor Company, White; Peleg Brown Company, Oldsmobile; Pugh Bros., National, Overland, Marion, American and Palmer-Singer; J. J. Nugent, Cartercar; E. E. Whipple, R. C. H.; Nock Auto Company, Lexington and Warren; N. Bostel, Baker electric; E. A. Dauer,

Haynes; Marmon Motor Car Company, Marmon Frank J. McCaw Company, Stevens-Duryea; Pawtud et Automobile Company, E-M-F and Flanders; Stalley Motor Carriage Company, Stanley steam; Capit Motor Car Company, Hupmobile; W. A. Wilcom Franklin; Whitten Motor Vehicle Company, Abbot Detroit, Oakland and Brush; R. G. Davis and Charle Barre, Lenox; Autocar Sales & Service Company, Autocar; North End Garage, Elmore.

Commercial vehicles—American Locomotive Company, Alco; Teel Manufacturing Company, Teel-Wood worth; Hitchcock-Banks Motor Car Company, Know William Hughes Company, Reo; Alvan T. Fuller Packard; Autocar Sales & Service Company, Autocar Davis Automobile Company, Gramm; Foss-Hugher Motor Car Company, Pierce-Arrow; Rhode Islam Motor Car Company, Pope-Hartford; KisselKar Company, KisselKar; North End Garage, Chase; Pugl Bros., Morgan; B. F. & A. W. Hopkins, International

Motorcycles—B. A. Swenson, Indian; Elmwood Cyclery, Harley-Davidson; Hirah G. Baxter, Excelsion

Accessories—Waite Auto Supply Company, Waite specialties and full line; B. A. Swenson, Swenson specialties; C. D. Paige, insurance; Salisbury & Nightingale, tubing; Post & Lester, general line; Brictson Manufacturing Company, Brictson treads, etc.; Kincaid Oil Company, Kincaid oils and greases; Scott & Farrell, insurance; Auto Parts Company, Ford accessories; J. A. Welch, Wayne oil tanks and pumps.

Exhibitors at Milwaukee.

Fifty-one thousand square feet of floor space will be occupied by the 112 models in the Auditorium at Milwaukee, Wis., during the week of Jan. 13-19. The decorations are in the hands of a New York City concern, the contract therefor amounting to \$20,000. The event is in charge of a committee composed of: F. J. Edwards, chairman; Edgar F. Sanger, Robert G. Bates, A. Reeke and George W. Browne. The drawing for space has resulted as follows:

Pleasure cars, main hall-Packard Motor Car Company, Packard; Studebaker Corporation, E-M-F and Flanders; Hickman-Lauson-Diener Company, Ford; Emil Estberg, Pope-Hartford and Woods electric; Milwaukee Electric Railway & Lighting Company; Rauch & Lang electric; Wisconsin Auto Sales Company, National and Herreshoff; American Automobile Company, Pierce-Arrow; Schreiber Motor Car Company, Locomobile, Haynes and Hudson; Buick Motor Company, Buick; Bates-Odenbrett Automobile Company, White, Abbott-Detroit and K-R-I-T; George W. Browne, Overland and Marmon; Franklin Auto & Supply Company, Franklin; Winton Motor Carriage Company, Winton; E. B. Leverenz, Elmore; Mitchell Automobile Company, Mitchell; Kopmeier Motor Car Company, Chalmers and Detroit electric; Edgar F. Sanger Company, Maxwell and Stearns; Smith-Hoppe

to Company, Hupp-Yeats electric, R. C. H., Oakid and Oldsmobile; Lozier Motor Sales Company, zier; Curtis Automobile Company, Reo; McDuffee itomobile Company, Stoddard-Dayton; J. H. Menll, Brush and Courier-Clement; Jay E. Morehouse, le and Hupmobile; La Cross Plow Company, Imrial; Orin R. Hughes, Garford and Everitt.

Pleasure cars, Juneau Hall—Jones Automobile mpany, Cadillac; Thomas B. Jeffery Company, Ram-

er; KisselKar Company, KisselKar.

Pleasure cars, Kilburn Hall—Auburn Auto Gare, Auburn; Tuschen Bros., Nyberg; Velie Motor chicle Company, Velie; Hustis Bros., King; Gas wer Engineering Company, Moline; Marx Bros., nion; Michigan Motor Sales Company, Michigan; rthur F. Tiegs, Colby; Henry Walter, Staver.

Pleasure cars, annex corridor—R. D. Rockstead, 'arren and Paige-Detroit; Johnson Service Company,

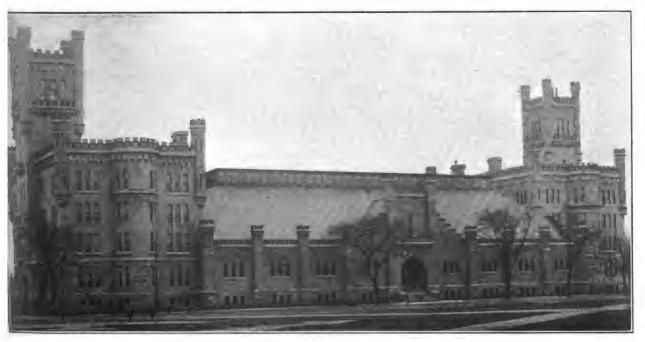
hnson.

pany, Milwaukee Oil Pump & Tank Company, O'Neil Oil & Paint Company, Goodyear Rubber Company, Wadmans Oil Company, Kamlee Company, Grafton Glove Manufacturing Company, A. S. Pierce, Western Fixture Company, Carbo-Light Company, General Welding & Manufacturing Company, Melli-Blumberg Company, H. W. Johns-Manville Company, Cotta Transmission Company, Modern Motor Company, Pyrene Company of Illinois, Auto Parts Manufacturing Company.

Tops and bodies, annex corridor—A. J. Monday, Cream City Trimming Company, Chas. Abresch Company.

Space Allotted at Omaha.

Clark G. Powell, secretary and treasurer of the Omaha Automobile Show Association, is general manager of the display which will be given by the dealers of Omaha, Neb., in the Auditorium, Feb. 19-24. Locations already have been allotted to the following:



State Armory, Providence, R. I., in Which Will Be Held Display of Rhode Island Licensed Automobile Dealers'
Association.

Commercial vehicles, basement—Universal Machinery Company, Universal; Buick Motor Company, Buick; American Locomotive Company, Alco; Crown Commercial Car Company, Crown; Orin R. Hughes, Garford; Packard Motor Car Company, Packard; Jos. Obenberger & Sons, Monitor; Curtis Automobile Company, Reo; Hickman-Lauson-Diener Company, Ford; McDuffee Automobile Company, Chase; D. F. Poyer & Co., Menominee; Johnson Service Company, Johnson; Stegeman Motor Car Company, Stegeman; KisselKar; Company, KisselKar; American Automobile Company, Pierce-Arrow; Bates-Odenbrett Automobile Company, White.

Accessories, main hall corridor—Wallman Manufacturing Company, Phillip Gross Hardware Company, Auto Supply Co., Julius Andrae & Sons Co., Franklin Auto & Supply Company, Garage Equipment Manufacturing Company, Milwaukee Photo Materials Com-

Apperson Automobile Company, Baum Iron Company, Cadillac Automobile Company, John Deere Plow Company, Deright Auto Company, Electric Garage Company, E-M-F Automobile Company, Firestone Rubber Company, Freeland Auto Company, Ford Motor Company, Frederickson Auto Company, W. L. Hoffman Company, International Harvester Company, Johnson-Danforth Company, R. R. Kimball Auto Company, Kissel Auto Company, Lininger Implement Company, Mitchell Motor Company, Andrew Murphy & Co., Marion Automobile Company, Nebraska Buick Auto Company, J. G. Northwall Company, Omaha Auburn Automobile Company, Omaha Rubber Company, Powell Supply Company, Rambler Motor Company, Guy L. Smith, United Motor Company, Van Brunt Auto Company, E. R. Wilson Auto Company, Wallace Automobile Company, Western Auto Supply Company. These have made application but have not been

assigned space: Nebraska Regal Sales Company, Traynor Auto Company, Cartercar Company, Inter-State Automobile Company, Jack Sharp, Great Western Automobile Company, Moline Automobile Company.

Atlanta Dealers Active.

Homer C. George is manager of the show which will be held in the Auditorium in Atlanta, Ga., Feb. 10-17. The committee in charge is composed of H. G. Moore, Frank P. Day, Charles L. Elyea, Frank J. Long, W. D. Alexander, Wylie West, John E. Smith The following exhibitors have and D. T. Bussey. been allotted space: E-M-F Atlanta Company, Georgia Motor Car Company, United Motor Atlanta Company, John E. Smith, Ford Motor Company, F. B. Stearns Company, Elyea-Austell Company, Matheson Automobile Company, Northcutt Company, Steinhauer & Wight, Anderson Top & Trimming Company, Auto Car Sales Company, Reed Oil Company, Johnson Curtis Autos Company, Velie Motor Vehicle Company, Overland Southern Motor Car Company, Packard Company, Mitchell Motor Company of Atlanta, Cole Motor Company of Georgia, Texas Oil Company, Alexander-Sewald Company, Locomobile Company of America, Herman J. Haas, W. W. Leathers, White Company, J. I. Case Company, Wayne Oil Tank & Supply Company, Chas. E. Miller.

Binghamton Spaces at Auction.

A large number of spaces for the automobile show to be held in the State Armory at Binghamton, N. Y., Feb. 20-24, have been sold at auction, the bidding being sharp and well contested. Among the exhibitors which have secured locations are the following: New York Sales Company, Hudson, Cole, Rambler and Paige-Detroit; Lowell, Hammond & Worden, Winton, Stearns, Marmon, E-M-F, Flanders and Pullman; Binghamton Ford Sales Company, Ford; S. H. Lewis & Co., Maxwell, Waverley electric, Franklin and Columbia; J. M. Davidge, Pierce-Arrow; R. W. Whipple, Packard; Abbott-Detroit Sales Agency, Abbott-Detroit; Palmer-Singer Agency, Palmer-Singer; Binghamton Cadillac Company, Cadillac; June Automobile Company, Brush, Chalmers and Mitchell; Lewis & Niblett, Reo; S. B. Judd Company, Overland; Purdy & Mix, Hupmobile and Fiat; Broome County Motor Car Company, American; H. W. Brown, Buick, Pope-Hartford and Thomas; Grace Bros., Oakland; Frank S. Bump Company, Indian and Racycle motorcycles; R. W. Whipple, Excelsior motorcycles; W. H. Wolfe, Harley-Davidson motorcycles; Standard Oil Company, Polarine oils.

Many Displays at Toledo.

Hugo V. Buelow, manager of the Toledo Automobile Dealers' Association in the Terminal Railway building, Toledo, O., Jan. 15-20, is particularly pleased with the manner in which the dealers have made request for space. The following exhibitors have been assigned locations: Pleasure cars-Grasser Motor Company, Crest Motor Sales Company, Northern Ohio Motor Car Company, United Garage Company, H. E. Throne, M. M. Kennedy, Blevins Auto Sales Company, Willys-Overland Company, Atwood Automobile Company, Union Supply Company, Lichtie Auto Company, Standard Garage Company, H. J. Adams, Banting Machine Company, United Motor Toledo Company, Rambler Motor Sales Company, Toledo Motor Sales Company, Bowersox Motor Sales Company, Abbott Motor Sales Company, Roberts Toledo Company, Stoddard Toledo Company, Ford Bros. Auto Company. Commercial vehicles—Atwood Automobile Company, James P. Locke, Grasser Motor Company, the shop of Siebert, H. J. Adams, Banting Machine Company, Blevins Auto Sales Company, Roberts Toledo Company. Accessories—Ray-Kuhn Company, Paragon Refining Company, Toledo Auto & Garage Company, Disco Auto Starter Company, Toledo Tire & Repair Company, Union Supply Company, McNaull Auto Tire Company, C. Z. Kroh Top Company, Toledo Rubber Company, Miller Storage Battery Company, Electric Auto Light Company, Northern Ohio Punctureless Tire Company.

Will Show in Detroit Annex.

As an evidence that Manager Walter Wilmot made no mistake in arranging for a temporary annex for the annual show of the Detroit Automobile Dealers' Association, Jan. 22-27, it may be said that the following applicants have been awarded space therein: J. M. Deford, Overland Motor Sales Company, Michigan Magneto Company, Bosch Magneto Company, Eby Auto Parts Company, Automobile Equipment Company, Herreshoff Motor Company, Paige-Detroit Company, S. K. F. Ball Bearing Company, George B. Moran, Grabowsky Power Wagon Company, American Steam Truck Company, Bigsby Manufacturing Company, E. P. West, Coleridge Motor Truck Company, Neumann-Lane Company, Flanders Motorcycle Company, KisselKar Company, Rudd Auto Top Company. Hayward Motor Car Company, Ignition Starter Company, Chas. E. Miller, J. P. Davies, Poss Motor Company, Miller Motor Car Company, Cunningham Auto Company, Bricston Manufacturing Company, Electric Products Company, Anderson Electric Car Company, Detroit Steering Wheel & Windshield Company, Oliver Motor Car Company, Sewell Cushion Wheel Company, Lion Motor Sales Company, Northway Motor & Manufacturing Company, Bover-Schliski Company.

Exhibitors at Davenport.

Sixteen dealers have secured space for the Tri-City Auto Dealers' Trade Association show in the Coliseum, Davenport, Ia., Feb. 28-March 2. The committee in charge is composed of Webb Mason, chairman; Mr. Wallace and William Totten. The following have secured locations: Roeske & Sindt, Ford; Buck Motor Car Company, Packard and Detroit electric; Witt & Lembrecht, Firestone-Columbus; Masons Carriage Works, Pierce-Arrow, Chalmers and Baker electric: Thomas Auto Company, Thomas; Inter-State Automobile Company, Inter-State, Flanders and E-M-F; Scott County Mercantile Company, Maxwell and Columbia; Iowa Auto & Tire Company, Cadillac; A Klemme, Buick; Petersen Automobile Company; Pope-Hartford, Overland and Regal; Davenport Auto Company, McIntyre; Totten Auto Company, Abbott-Detroit and Lozier; Yeggy-Don Auto Company, Knox and Woods electric; Horst & Streeter, Moline; Shallberg Auto Company, Stoddard-Dayton and Rauch & Lang electric; Midland Motor Car Company, Midland.

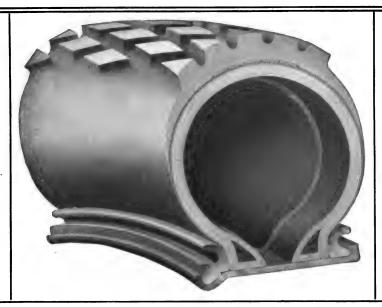
Brooklyn Space Is Limited.

Practically all of the show space for the second annual display of the Brooklyn Motor Vehicle Dealers' Association in the 23rd Regiment Armory in Brooklyn, N. Y., has been allotted by the committee in charge, as follows: J. Matchett, Marion and American; W. H. Kouwenhoven, Locomobile; E. T. Bloxsam, Peerless; W. H. A. Burns, Chalmers; C. J. Max-



Made With or
Without this
Double-Thick
Non-Skid Tread

The Only
Winter Tread
With a
Bulldog Grip



Note the
Double Thickness
Note the
Deep-Cut Blocks

Note the Countless Edges and Angles

No-Rim-Cut Tires

10 Per Cent. Oversize 1911 Sales—409,000 Tires

Stop for a moment, Mr. Tire Buyer, on this verge of 1912.

Consider how motorists are coming to Goodyear No-Rim-Cut tires.

Six times the demand of two years ago—800,000 sold.

Enough sold last year to completely equip 102,000 cars.

Now the most popular tire in existence.

Just because one user says to another—"These tires avoid rim-cutting, save overloading. They've cut my tire bills in two."

For the coming year, 127 leading motor car makers have contracted for Goodyear tires. We've increased our capacity to 3,800 tires daily.

Now make a resolve—to save worry and dollars, to give perfection its due—that you'll make a test of these patented tires.



THE GOODYEAR TIRE & RUBBER CO..

Griswold Street, AKRON, O.

Branches and Agencies in 103 Principal Cities. We Make All Kinds of Rubber Tires, Tire Accessories and Repair Outfits

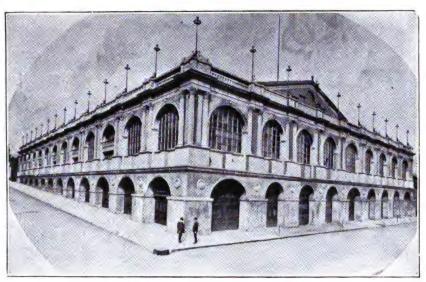
Main Canadian Office, Toronto, Ont.

Canadian Factory, Bowmanville, Ont, (478)

son, Reo and Premier; D. M. Hasbrouck, Mitchell; Thomas H. Wood, Oakland; A. W. Blanchard, Fiat and Pope-Hartford; I. C. Kirkham, Maxwell and Columbia; C. M. Bishop, Cole and Ford; A. E. Randall, Cadillac; H. L. Carpenter, E-M-F and Flanders; Joseph D. Rourke, Haynes; A. D. Crowin, Buick; Charles F. Blatt, Halladay; I. M. Allen Company, Stevens-Duryea; Walter Candee, Stoddard-Dayton; S. D. Miller, Hudson.

Virginia Show at Norfolk.

The newly organized Norfolk Automobile Trade Association will hold a show in Norfolk, Va., probably the week of March 2-9. The committee is composed of J. K. Waterman, chairman; C. O. Wrenn, Cary P. Weston, William Brodick and T. Gray Coburn. The following dealers have applied for space: Coburn Motor Car Company, E-M-F, Flanders and Thomas; Ball & Co., Buick and Stoddard Dayton; C. W. Bender, Polarine oils; Tidewater Automobile & Garage Company, Locomobile and Haynes; J. K. Waterman, New York trucks; Chalmers Motor Car Company of Virginia, Chalmers; Mitchell Agency of



Auditorium in Kansas City Where United Dealers Will Hold Their Annual Show.

Norfolk, Mitchell; C. E. Wright & Co., Overland; A. W. Depue, Marmon; E. E. Guy's Sons, Goodyear tires and accessories; E. L. Myer, Maxwell; Reliance Electric Company, Waverley electric; A. Wrenn & Sons, Cadillac; Bell Motor Company; R. W. Chapman, National.

Makes at Minneapolis Display.

W. R. Wilmot, manager of the Minneapolis Automobile Show Association, is meeting with splendid success in completing arrangements for the show in the National Guard Armory, Minneapolis, Minn., Feb. 17-24. Among those who will make display are the representatives of the following cars: American Brush, Buick, Cadillac, Chalmers, Columbia, Columbus electric, Courier-Clermont, E-M-F, Flanders, Flanders electric, Firestone-Columbus, Ford, Gramm truck, Haynes, Herreshoff, Inter-State, Kelly truck, Lozier, Marmon, Maxwell, Mitchell, Ohio electric, Overland, Packard, Paige-Detroit, Peerless, Rambler, Regal, Reo, Sampson, Stearns, Stevens-Duryea, Stude-

baker electric, Thomas, Utility truck, Velie, Waverley electric, Wilcox truck, Winton.

News from Other Cities.

All differences heretofore existing between the dealers in Kansas City, Mo., have been settled to the satisfaction of all concerned, and the Kansas City Motor Car Dealers' Association, formed from the two old associations, is planning the greatest show that Missouri or the Southwest has ever known. This will be held in the Convention Hall, Feb. 12-17, and it is expected that the list of exhibitors will far surpass any previous effort. The show committee is composed of C. B. Riggs, chairman; George A. Bond, F. S. Dey, Estel Scott and E. R. Hunniwell. Wallace J. Ferry, 911 Gloyd building, is manager.

Elaborate preparations are under way for the second annual show in Fall River, Mass., Feb. 12-19. The newly organized Fall River Automobile Dealers Association will take charge of the event, and practically every dealer in the city will secure space. The committee of arrangements is composed of Byron W. Cottle, Robert W. Powers, John B. Quinn, Al-

bert A. Mills and David M. Connell.

The Automobile Trade Association of Memphis, Tenn., will hold its second annual show in the Auditorium, Feb. 12-19. It is anticipated that at least 50 per cent. more room will be available than was the case in 1911. The show committee is as follows: Jerome P. Parker, Aubrey Clapp, Sid. Black and W. R. McDonald.

Montgomery, Ala., expects to have its first automobile show during the last week in January. Representatives of the American Automobile Show Company of Memphis and the Berger Aviation Company have been interesting the Business Men's League in a proposition to hold a combined show and aviation meet, and it is understood they are meeting with success.

Although Buffalo, N. Y., has just closed one show, a second exhibition for those who were unable to se-

cure space in the 74th Regiment Armory will be held in Convention Hall, Feb. 5-10. Many applications for locations have been received by the manager, George C. Fehrman, 755 Ellicott square.

The Cleveland Automobile Show Company, with the sanction and co-operation of the Cleveland Automobile Club, will hold a show in the Central Armory. Cleveland, O., Feb. 17-24. The show committee consists of the following: H. M. Adams, W. H. Barger. C. M. Brockway, Fred C. Wood, Ray M. Colwell, H. J. Twelvetree, Harry S. Moore, C. H. Taylor. The manager is Fred H. Caley.

Working in conjunction, the Dayton Automobile Club and the Dayton Automobile Dealers' Association will hold a show in Memorial Hall, Feb. 12-19. Elmer Redelle has been selected as manager, and the committee is as follows: William Stroop, E. A. Deeds, Walter Kuhns and Walter Kidder for the club, and G. L. Baker, W. H. Peazel, George W. Shroyer, Earl Hosler and G. G. Peckham for the association.

Paterson, N. J., hopes to attract a large number of outside dealers to its show in the Fifth Regiment armory, Feb. 26-March 2. Applications for space have been received in large numbers since the prelimnary announcement early last month, and there is every prospect that a large representation of 1912 nodels will be seen at the exhibit. The officers of the issociation in charge of the display are: President, Edward A. Brown; vice president, Thomas Hughes;

secretary, H. McGinley; treasurer, Rev. George M. Dorwart.

Applications for space at the exhibition of the Newark Automobile Show Company, in the First Regiment Armory, Newark, N. J., Feb. 17-24, are being received by Manager Horace A. Bonnell. His office is at 845 Broad street, Newark, N. J., where all inquiries for information in regard to space, etc., should be directed.

SOCIETY OF AUTOMOBILE ENGINEERS' ANNUAL MEETING.

As previously announced the annual meeting of the Society of Automobile Engineers will be held in New York City during the second week, or commercial vehicle division, of the Madison Square Garden show, Jan. 18-20. During the first session the result of the counting of the ballots for officers will be announced. According to the constitution, the president, as well as some other officers, cannot be reelected to succeed themselves. Those who will retire at this time are: President Henry Souther, First Vice President Henry G. Chatain, Second Vice President R. C. Carpenter, Treasurer A. H. Whiting, and Hermann F. Cuntz, W. G. Wall and H. F. Donaldson, members of the council. The nominating committee has made the following nominations for these vacancies, which probably will mean their election: President, Henry F. Donaldson; first vice president, H. W. Alden; second vice president, Harold L. Pope; treasurer, Hermann F. Cuntz; members of the council, A. L. Riker, Charles B. Whittelsey, A. B. Cumner and Henry Souther.

The standards committee will meet at the offices of the society, Jan. 16, at 10 in the morning, at which time reports will be made by all sub-divisions, prior to their approval for submission to the annual meeting. The evening of Jan. 9, members of the society

were entertained at the rooms of the Automobile Club of America, when Prof. F. R. Dutton, chairman of the club's technical committee, read an interesting paper on the subject of carburetion, and Charles H. Manly made an address concerning his hydraulic system of transmission for commercial cars.

Jan. 10 at 9 in the morning a special advisory committee held a meeting at the New York office for the purpose of discussing the subject of standardization as applied to the electric lighting of automobiles. This committee is composed of the following: Alexander Churchward, Gray & Davis; C. F. Splitdorf, C. F. Splitdorf's Laboratories; V. G. Apple, Apple Electric Company; C. F. Kettering, Dayton Engineering Laboratories; F. E. Moskovics, Remy Electric Company, and Leonard Kebler, Ward Leonard Electric Company.

The committee practically has decided upon standard voltage and bases for incandescent bulbs, and has under consideration the following:

Output in volts and amperes, speed at this output, size of battery to be used, size of lamps for headlights and other lights, distance from base to centre of generator shaft, base dimensions of generator, sizes of wire, type of insulation and connectors for lamps,

BUFFALO DEALERS HOLD THEIR FIRST DISPLAY.

The 10th annual show of the Buffalo Automobile Trade Association was held in the 74th Regiment Armory, Buffalo, N. Y., Dec. 30-Jan. 2. The available floor space afforded opportunity for the largest and most carefully planned exhibition yet attempted in that city. Over 350 models of 1912 cars were to be seen, many of them being specially prepared show machines which were shipped to New York for the metropolitan displays as soon as the show was over.

The decorations comprised a holiday setting, in which the white columns were profusely entwined with green leaves. Thousands of electric lights aided in bringing out the color effects. Each exhibition space was set off by specially designed banners bearing the name of the firm and the make of car or accessory and the whole result was most pleasing in every particular. The list of exhibitors included the following:

Pleasure cars—Pierce-Arrow Sales Company, Pierce-Arrow; Ralph E. Brown Motor Cur Company, American, Winton and Baker electric; Zimmer Motor Vehicle Company, National and Pathfinder; Overland-Buffalo Company, Overland; George Ostendorf, Franklin; L. G. Dodge, Oldsmobile; Mason B. Hatch, Hupmobile, Chalmers and Stearns; Hupp Corporation, R. C. H. and Hupp-Yeats electric; Poppenberg Motor Car Company, Everitt, Warren, Paige-Detroit, Marathon and Westcott; Dixon Motor Car Company, Velie;

Harry L'Hommedieu, Marion; United Motor Buffalo Company, Maxwell and Columbia; Studebaker Corporation, E-M-F and Flanders; E. R. Thomas Motor Car Company, Thomas; John J. Gibson Company, Mitchell; Centaur Motor Company, Oakland; Kane Motor Supply Company, Cadillac; Barrett Motor Car Company, Hudson; Clark Motor Company, Van Wagoner electric; Matheson Automobile Sales Company, Matheson, De Tamble and Union; United States Auto Station, Rauch & Lang electric; J. A. Cramer, Stoddard-Dayton; Henry Brunn Automobile Company, Peerless; Co-Operative Motor Car Company, Abbott-Detroit, Pope-Hartford and Stevens-Duryea; Ford Motor Company, Ford; Buffalo KisselKar Company, KisselKar; Meyer Motor Car Company, Knox, Pullman and Reo; Frontier Motor Car Company, McFarlan; Lutz Automobile Company, Premier and White.

Commercial cars—E. E. Denniston Company, Denniston; Lippard-Stewart Motor Car Company, Lippard-Stewart; Poppenberg Motor Car Company, Victor; Pierce-Arrow Sales Company, Pierce-Arrow; Dixon Motor Car Company, Velie; Louis Debo, Hatfield; Clark Motor Company, Van Wagoner electric; Henry Brunn Automobile Company, Peerless; Ford Motor Company, Ford; Co-Operative Motor Car Company, Pope-Hartford; Meyer Motor Car Company, Reo; Lutz Automobile Company, White.



Accessories—Standard Oil Company, Polarine oils; Brunn & Co., tops and bodies; Polson Manufacturing Company, windshields; Jaynes Automobile Supply Company, general line; Frey Automobile Supply Company, De Luxe overhead washers; Iroquois Rubber Company, G & J tires; Frontier Rubber Company, Frontier tires; Chas. E. Miller, full line; Niagara Lead & Battery Company, Salom batteries.

AMERICAN AUTOMOBILE ASSOCIATION ROAD CONGRESS.

The federal aid convention of the American Automobile Association will be held in the Hotel Raleigh, instead of the New Willard as previously announced, Washington, D. C., Jan. 16-17, the object being to formulate some plan of action with respect to the numerous bills now before Congress. The recent speech of President W. H. Taft before the Automobile Club of America, in which Le expressed the opinion that although the government undoubtedly possessed the power to appropriate federal money for good roads work, it was unwise to do so, does not appear to have affected the enthusiasm of those in charge of the plans for the coming convention.

Among those who have promised to discuss the question of federal aid from various standpoints are

the following: Senators F. M. Simons of North Carolina, Claude A. Swanson of Virginia, John H. Bankhead of Alabama; Representatives R. P. Hobson and William Richardson of Alabama, E. T. Taylor of Colorado, William S. Howard of Georgia, H. M. Tower of Iowa, P. P. Campbell and D. R. Anthony, Jr., of Kansas, J. C. Linthicum of Maryland, D. W. Shackleford and William P. Borland of Missouri, J. J. Whitacre of Ohio, James F. Byrnes of South Carolina, H. D. Flood of Virginia and J. A. Hughes, West Virginia: Speaker Champ Clark of the House of Representatives; President C. S. Barrett of the Farmers' Union, and F. J. Brooks of its legislative committee; Dr. E. Stagg Whitin, secretary of the national committee on prison labor.

ENTRIES FOR SECOND ANNUAL 500-MILE RACE.

Although the second annual 500-mile race on the Indianapolis speedway, Memorial Day, is still some five months away, five entries have been received by the management and several others are promised. Entries do not close until May 1, so there is still ample time in which the manufacturers may make up their minds.

The Ideal Motor Car Company, Indianapolis, Ind., has entered two Stutz cars. Gilbert Anderson, who drove cars of this make with such splendid success during 1911, will be at the wheel of the first, and it is rumored that the second driver will be William Knipper, although no official announcement has been made.

The third entry is that of E. E. Hewlett, Los Angeles, agent for Fiat cars. Joseph Matson, who drove a Fiat in the recent Grand Prize race at Savannah, Ga., will be its pilot. The fourth and fifth entries were made this last week by Spencer E. Wishart and Ralph De Palma, who will drive Mercedes.

MAINE MOTORISTS BEGIN LONG TOUR.

Clarence B. Partridge and Leigh V. Shaw of Augusta, Me., left that city recently on a cross country tour which will embrace the southern states in the trip to Los Angeles, Cal. They expect to travel about 5000 miles and accomplish the journey in about 40 days, as they will make easy stages.

The car is a 50 horsepower machine which was prepared especially for the trip. It is fitted with a canvas top of the prairie type, and this cover is pro-

vided with sides of similar material. A collapsible bed that automatically slides over the seats, is included. Short stops will be made in all of the large cities and places of interest, and upon reaching Los Angeles the tourists plan to remain about six weeks. Gov. Plaisted presented them with an American flag in front of the state house upon the start of the trip. The party expects to return over the road, reaching Augusta about the middle of April.

MANY CITIES DESIRE RACE SANCTIONS.

Many requests have been filed for sanctions to hold race meets during 1912 and the contest board of the American Automobile Association is busy arranging the calendar. Indications point to a large number of road events.

Savannah is not expected to renew the Grand Prize and Vanderbilt Cup races, as the promoters feel that they have performed their share, and it would appear that unless the city takes the situation in hand, the classic events will be held elsewhere.

Elgin has applied for Aug. 30 to 31, at which time

the national stock championships will be held. Promoters are active on the Pacific Coast and the meet at Santa Monica, Cal., will be attractive as leading cars and drivers will compete. Another road race in that state will be at Bakersfield, probably on Washington's Birthday. This is said to take the place of the Panama-Pacific contest that was to have been held in San Francisco. It is not expected that the motor speedway to be built on the Jersey Meadows near the Manhattan transfer station will be completed in time for 1912 race meets.

TEXAS CLUB PLANS MOTORDROME.

The San Antonio Automobile Club, San Antonio, Tex., is planning the erection of a motordrome between one and three miles in length and if completed will provide one of the best racing courses in the country. Efforts are to be directed toward the construction of a good track rather than one unusually long and it is proposed to use material that will per-

mit the holding of races immediately after a rainstorm. Dr. F. J. Fielding of the club is enthusiastic over the prospect as he says that with the establishment of such a track San Antonio will become the centre, geographically, of the Florida to California racing circuit and would provide the city with at least two big race meets yearly, one in the spring and fall.



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MANUFACTURERS—The Bosch Enclosed Type Magneto illustrated, in addition to maintaining the high degree of excellence characterizing Bosch Products during the past twenty-five years, is absolutely oil, dust and water proof.

Bosch should be part of your 1913 equipment.

First display of this type at the New York Show, Jan. 6th-20th.

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LAMBERT DEMOUNTABLE RIM.

The Lambert demountable rim, made by the American Rim Company, 250 West 54th street, New



Lambert Rim Is Operated at One Point,

York, N. Y., has a channel section to take the tire shoe that may be contracted or expanded, and its retention in the wheel is by a single bolt that may easily be tightened or loosened. The claims made for this rim are numerous and chief among them is simplicity, in that it automatically locks and seats itself when one nut is tightened, that it has but one moving part, and it is foolproof.

These rims are made for any standard sized wheel and for any standard rim or type of tire, either clincher or quick detachable, and they are adapted to all makes of cars. The rim that attaches to or surrounds the wheel felloe may be installed by any wheelwright, the operation being exceedingly simple with ordinary facilities.

Those who have installed and removed clincher or quick detachable tires realize the possibilities for trouble with either or both forms of equipment, the necessity of providing special tools, and the vexations of doing the work in the rain, mud, snow or extreme cold or heat. Besides, there are the losses of time. A shoe bead may be too stiff to manipulate, the shoe may be "frozen" to the rim by rust, tools may be lacking, one may be too cold to work, or other conditions may arise where a replacement of a tire may only be accomplished with much difficulty, while under the most favorable circumstances a considerable work is entailed.

The Lambert rim differs with others in that the channel is split and the ends lap, with means for engaging and holding the ends of the rim at a certain diameter. A series of lugs within the rim contact with the wheel rim and the entire assembly is firmly held by a single bolt on which is a nut with a notched flange that engages with a pawl that prevents any possibility of the nut loosening.

To remove the rim for the replacement of any form of tire the nut is tightened slightly with a breast wrench so that the pawl is disengaged. The nut is then loosened and as it is backed off the bolt it brings

the rim with it positively and easily, and in exceedingly quick time. Free of the bolt the rim may be lifted and then when held upright a compound lever is applied at the lap which slips the lapping ends further past each other, reducing the circumference of the rim sufficiently to separate it effectually from the tire shoe. This operation is unfailing. The rim is pushed from the shoe and a new tire is installed by a reversal of the process, the rim being expanded and locked and then placed on the wheel. The inflation of the tire may be necessary if a tube should be replaced, but a shoe may be carried inflated on a spare rim if this should be desired. In installing the rim there is no possibility of mistake as it will fit but one way. rim has few parts, only one of which is moving, and there is nothing that can be damaged by contact with a curbstone or other obstruction.

It is claimed that the tire can be changed quicker than any other practical rim made, that two minutes is a reasonable allowance for a man who is expert, and that a change has been made in 15 seconds during demonstration. It is also stated that the use of Lambert rims will largely economize tires. The rims are guaranteed during the life of the car on which they are installed.

LANCIA AGENCY IN NEW YORK.

Before sailing for home recently, Vincenzo Lancia, formerly a well known racing driver, and now manufacturer of a pleasure car bearing his name, appointed the T. E. Adams Company of New York City, the American agent for these machines. Headquarters will be established at 235 West 58th street.

DISBROW HEADS CASE TEAM.

Announcement is made that Louis Disbrow, holder of many long distance racing records, will head the racing team of the J. I. Case Threshing Machine Company, Racine, Wis., during 1912. It is understood



Rim Forced from Wheel When Nut Is Turned,

that he will have a specially designed Case machine, which will bear the name of J. I. See, after the famous race horse.



NATIONAL AGENCY IN BOSTON.

With the opening of the New Year in Boston, omes the announcement that the National car, made by the National Motor Vehicle Company, Indianapolis, ind., will be represented in that city by W. H. Stevens, who was for a number of years connected with the Park Square Automobile Station and later with the Stoddard-Dayton Sales Company. He will establish headquarters at 642 Beacon street, where a full line will be carried. His territory includes all of eastern New England.

CARTERCARS FOR AUSTRALIA.

The Parke-Davis Company, a drug manufacturing firm in Detroit, recently purchased two Cartercars, made by the Cartercar Company, Pontiac, Mich., which will be presented to its representative in Australia. This make of machine has an enviable reputation for reliability, and the Parke-Davis Company is only one of several concerns which have purchased them in large numbers for the use of their salesmen.

RUBBER CONCERN INCREASES CAPITAL.

Because of a largely augmented business during the past few months the Miller Rubber Company, Akron, O., has increased its capital stock from \$500,000 to \$1,000,000. It is understood that the additional money is to be devoted to the enlargement of the plant to about double its present capacity, to enable the production of Miller tires and tubes in sufficient quantities to satisfy the demand.

MRS. KING SELLS E-M-F'S.

Among the hundreds of contracts renewed for 1912, by the Studebaker Corporation was that of Clough & King, Burlingame, Kan. The firm has been handling E-M-F and Flanders cars for the past two years, and the remarkable part of the situation is that the King in the company is a woman, probably one of the first women dealers in the country.

Mrs. King took up motoring for her health. She drove a 30 horsepower E-M-F car 15,000 miles in a year, raising her weight from 115 to 175 pounds. She decided to continue motoring as a matter of business, and does her own demonstrating.

DEATH OF HARLAN W. WHIPPLE.

Harlan W. Whipple, a former president of the American Automobile Association and one of the originators and principal stockholders in the taxicab service companies in New York, Boston and Providence, died suddenly of heart disease in Lawrence, Mass., Christmas Day. He will be remembered as an organizer of motoring associations, in which he took a deep interest.

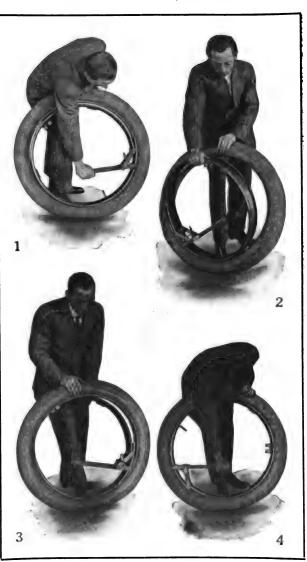
WHITE MAN GAINS PROMOTION.

James A. Harris, Jr., for some time associated with the White Company, Cleveland, O., maker of White pleasure and commercial cars, has been ap-

pointed advertising manager. The promotion is well deserved, and Mr. Harris has a wide circle of friends in the industry who will be glad to learn of his success.

MAINE MOTORISTS ELECT DIRECTORS.

The annual meeting of the Maine Automobile Association was held in Portland, Dec. 21, the follow-



1—Lambert Rim Contracted to Remove Shoe. 2—Shoe Easily Separated from Rim. 3—Rim Replaced Ready for Expanding in Shoe. 4—Rim Expanded and Positively Locked in Tire Casing.

ing directors being elected: Dr. John F. Thompson, William N. Taylor, E. A. Doten, Philip J. Deering and Silas B. Adams of Portland; F. L. Allen of Fairfield, George M. Atwood of Paris Hill, Hartley Baxter of Brunswick, and A. Q. Miller of Auburn. Prof. G. T. Files advocated decisive action in favor of good roads, and the association agreed to start a campaign which shall not end until its desires for betterways have met with compliance by the authorities.

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PAWTUCKET, R. I.

TIMES BUILDING



VOL. XXXII.

NO. 11.

Published the 10th and the 25th of Each Month.

William H. Biack, Treasurer. D. O. Black, Jr., Secretary.

ADVERTISING DEPARTMENT.

NEW YORK DETROIT CHICAGO BOSTON W. R. Blodgett C, A. Eldredge P, G. Lurian John W. Queen

25 42nd Street 304 Sun Building 1614 Belle Plaine Avenue 6 Beacon Street

Subscriptions :

The United States and Mexico, the year, \$1 in advance, canada and Foreign Countries in Postal Union, the year, \$2 in advance. Ten cents the copy.

Advertising Rates :

Information given at request. All advertising copy to insure publication must reach this office 10 days preceding the date of issue.

Remittances should be made by Check, Draft, Postoffice, Express Money Order, or Registered Letter. Money enclosures must be at sender's risk.

Entered as second class matter, April 16th, 1906, at the Postoffice at Pawtucket, R. I., under the Act of Congress of March 3rd, 1879.

OUTLOOK FOR 1912.

If the glowing reports of business conditions in various sections of the country, made by manufacturers' agents who have visited many of the large centres, may be taken at anything like face value, 1912 offers a bright outlook for the automobile industry. It is particularly significant that many concerns are engaged in enlarging their plants and advertising for additional workmen. This situation is apparent much earlier this season than heretofore, indicating that with the advancement of the practical motor car, there is much greater use of the machine throughout the entire year. Winter no longer means a period of idleness for the self-propelled vehicle.

The so-called national automobile shows still retain their stimulating effect, but it is notable this year that prospective purchasers are not waiting until the last minute before giving their orders. Then too, this stimulation is being carried into nearly every business centre throughout the country; hardly a city of sufficient importance to boast of a building large enough to house a representative display being without its motor car exhibition. It may be regarded that the business of marketing automobiles has reached a point where it is more readily compared with that of other institutions.

All this may be held to apply more particularly to the so-called pleasure vehicle, but when the industrial transport is considered, it is seen that the demand is far from having been supplied. The business man habeen occupying the position of one who seeks to be convinced. This has not disappeared altogether, but there is a well defined tendency toward the universal adoption of motor trucks for all forms of service. There are some things yet to be solved, but for the most part, the outlook for commercial automobile during the coming year seems even brighter than the for its predecessor.

The market appears as firm as ever. New conditions have arisen, and those engaged in making sale must readjust their plans to the newer order. The establishment of service stations and a policy of watching carefully the cars already in use are indications of the manner in which the manufacturer is seeking unassist the dealer in building a stable foundation. If forecast of the 1912 season indicates a healthful condition and there seems little doubt that expectation will be realized fully.

Massachusetts demands that every vehicle using the public highways during the hours of darkness shall be equipped with suitable lights. Why don't you advocate similar measure for your state? Now is the time to at

THE LEGISLATIVE SEASON.

Now that the position of the self-propelled road vehicle, whether for pleasure or business purposes, has become well defined as a thoroughly practical institution, organizations of motorists may well give their attention to the consideration of legislative topics. Until within the past year or so these associations were too busily engaged in defending their position to formulate a programme of their own. It almost seemed that many legislators gained the impression they had been elected to office for the purpose of devising ways and means for retarding the progress of this modern method of transportation.

It will be remembered that when the motorists of Connecticut sought to secure a better automobile law last winter many were inclined to believe it was best to let well enough alone. This same situation arose in Massachusetts, but the passage of more favorable legislation in both states seems to indicate that a spirit of aggression is quite possible of producing favorable results.

At the recent annual meeting of the Maine Automobile Association it was decided to formulate a plan of action with regard to better highways and to inaugurate a legislative campaign which shall not be abandoned until the desired results have been obtained. Motorists in other commonwealths would do well to emulate this example.

Recent conferences of state officials give additional hope that uniform motoring laws will be passed in a number of states during the coming season. It will need some aggressive work on the part of organized motorists to continue that started by these officials however. The same thing applies with equal force to the proposition for universal lighting. Well thought



it programmes and definite plans for putting them to execution will bring success in time, and the oner automobilists resolve upon this course the licker will results become manifest.

Universal lighting means the safe use of public ways night. It need not inflict unreasonable restrictions on yone. Why not follow Massachusetts' example?

PROGRESS OF AVIATION.

The year 1911 will be remembered in history as aving made decided progress in the field of aerial avigation. America has played its part in the adancement, although much credit must be given to reign constructors. When the question of practicality is raised, it may be seen that the United States ccupies a favorable position in the list.

Aeroplanes have been used for the first time in ctual warfare. There were many who considered is would prove their sole practical service. Perhaps neir full value in this regard cannot be learned until prortunity has been had for their use by opposing ides. At present but one army has been equipped with flying machines.

The records for speed, altitude, duration, passener carrying and the like still remain abroad, alhough new marks were set for a time in America. The greatest distance flown without alighting has seen raised from 362 miles to 462. The maximum peed has been increased from 67.5 miles an hour to 32.5. Duration in the air has been raised from 3:12:00 to 12:12:00. The altitude mark was 10,745 eet a year ago and is now 13,950. Seven passengers have been carried aloft for 1:30:00.

The thorough practicability of some of these things nay be open to question. The relative value of the 'ear's results depends largely upon the point of view. It may be that the development of the hydro-aeroplane by Glenn H. Curtiss and others will prove of greater benefit to mankind than any of these.

Constructors on both sides of the Atlantic seem to have realized the necessity for experimenting with new designs, the principal feature of which has been an effort toward more natural stability. In this connection the demonstrations made by Orville Wright and his motorless glider at Kitty Hawk, N. C., are most important.

As a whole the year has developed a desire to place the new invention more nearly in the realm of scientific investigation, and it would appear that the spectacular side has been displaced in no small measure.

Automobilists should advocate uniform motoring laws, because in no other way can the present confusion of interstate touring be avoided.

REFINEMENTS IN ACCESSORIES.

One of the features of the present shows in New York City is the attention being paid to the matter of refinement in accessories and fittings, both with respect to those furnished as standard equipment on the cars themselves and those displayed by the makers at their

own stands. This is noted in the electric lighting systems, self-starting devices, tire inflators, lifting jacks and any number of others.

There appears to be a disposition to meet the desires of the motorist in providing that which will eliminate some of the more disagreeable tasks connected with the use of the car. Not only do these devices make motoring more pleasurable, but they have the added advantage of insuring that once started on the trip there shall be no tedious delays. Even if trouble occurs on the road, these labor saving appliances often will save much more than their original cost, either by reducing the time necessary to make repair or by eliminating the possibility of damage to clothing or other articles.

Universal lighting and uniform laws are the prime necessities for safe and sane motoring,

FOREIGN INVASION OF AMERICA.

Much has been said about the American invasion of other countries, and when it is known that the exports from the United States during 1911 have aggregated a total of some 18,500 cars valued at \$13,000,000, an increase of more than 55 per cent. over the foreign business done in 1910, there seems to be some ground for the suggestion. However, it is interesting to note that numerous European manufacturers have been establishing agencies in America during the past few weeks.

That there is to be a determined effort to secure additional business in the United States is made clear from the fact that many specially designed show cars were sent to New York from abroad for the Importers' Salon just closed. The situation probably does not indicate a spirit of retaliation in any sense of the word, but may be regarded as evidence that foreign makers have been aroused by the aggressiveness manifested by American producers, and propose to meet them upon their own ground.

AUTOMOBILES IN NATIONAL PARKS.

For some time motorists have been trying to induce the United States government to permit them to enjoy the beauties of the so-called national parks in the far West, but for some reason a determined opposition appears to have won out. The decision applies to the Yosemite national park of California, but there is every probability that the same result will obtain with reference to the Yellowstone national park as well.

The government holds that: "It is impracticable to permit automobiles in this park, because their presence practically would eliminate travel by stage, the roads being in such condition that it would be dangerous for teams and automobiles to meet." It might be suggested that the roads be improved, but it is feared that this plan would not do away entirely with the monopoly enjoyed by those who operate the stage lines.



MECHANICAL NOTES FOR OWNERS

Methods of Simplifying the Care and Maintenance of the Car, Discussion of Pertinent Facts and Notes on Operation.

BOSCH TWO SPARK MAGNETO.

The practise of fitting some form of magneto to the automobile power plant is universal today and even the low priced car is equipped with some type of current generator. Its advantages over the battery and coil system are numerous and perhaps are most appreciated by the motorist who has become familiar with the vagaries of the latter through experience. Although the magneto may appear to be somewhat mysterious to the uninitiated, it really is a simple device requiring little if any attention.

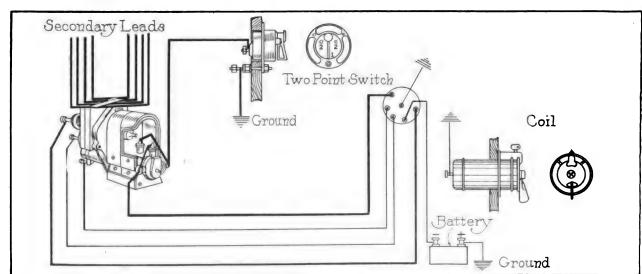
It is well understood by the operator of a motor car equipped with batteries only, that when these become nearly exhausted, the efficiency of the engine is impaired, and its action is sluggish. This is in decided contrast to the conditions existing when the battery is charged to its full capacity. The maximum power is developed by the production of heat in the combustion chamber, or in other words, when a greater portion of the charge is burned.

Part of the heat that is released by the combustion of the mixture expands the gases and produces

pressure against the piston, while the balance is lost through the cylinder walls or passes out through the exhaust. The proportion of heat actually applied is very small. The highest possible efficiency would be obtained if the charge could be ignited and burned completely at the instant the piston was at the top of the compression stroke, but this condition does not exist in practise because of the time required for the flame to travel through the vapor from the point of ignition.

In order to bring about a complete combustion it is necessary to ignite the charge before the piston reaches the end of its compression stroke, so that during the latter part of this operation, and while the member is moving upward, the charge has begun to burn and the gases to expand. It is reasonable to presume that this expansion produces more or less pressure against the piston. This is similar to cranking the motor with the spark advanced. The amount of advance necessary to bring about proper combustion varies according to the design of the motor.

With the single point ignition, the spark occurs in the cylinder at some point near the completion of



Wiring Diagram of Bosch Two-Spark Dual System, Heavy Lines Indicating High-Tension Leads-Use of One Both Sets Is Secured by Means of a Two-Way Switch and Provision Is Made for Incorporating a Battery.

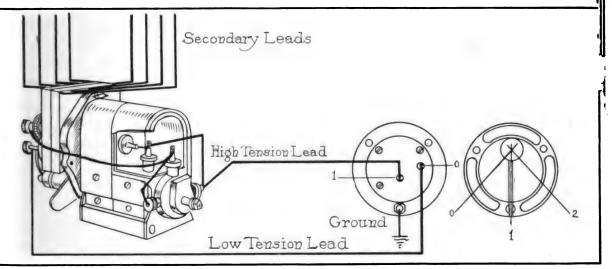
compression stroke, this being such that the vapor be completely ignited at the instant the piston ains top dead centre. When a single spark plug located at one side of the cylinder, the flame must rel to the opposite side of the member in order consume the mixture. This loss in time is offset advancing the time of ignition, commonly known motorists as "advancing the spark."

Experiments with dual ignition points were concted recently at a meeting of the Society of Autobile Engineers. The motor was mounted on the namometer in the laboratory of the Automobile ub of America, New York City, and run under a mber of conditions with the single and dual sysms. With the former, 24 horsepower was the best veloped with the single speed at 1750 revolutions a inute. With the Bosch two-spark magneto, made the Bosch Magneto Company, New York City, the me energy was developed at 1500 turns. Even than increase in the number of revolutions with e single spark, the horsepower was not augmented,

plug, to the second distributor, returning to the other end of the high-tension winding, thus completing the circuit. The arrangement of the primary circuit is unchanged and the production of sparks is governed by the action of the usual single primary interrupter.

This production of sparks is absolutely simultaneous, an essential feature of dual sparking. In addition to increased efficiency, reliability is claimed, at the two plugs are said to be less susceptible to oil that the one of the single system. Furthermore, the breaking down of one plug will not cause the cylinder to miss, as combustion is produced by the remaining extra member.

One of the benefits of the dual ignition is the control of the spark, the maximum advance being from 15 to 18 degrees against about 32 degrees required with the single spark. When the motor is throttled down with the latter the spark is retarded approximately to about dead centre. With the maximum output of the motor being derived at a 15-degree ad-



Wiring Diagram of Bosch Two-Spark Independent System, the Switch Positions Being Neutral, for One Set of Plugs or Both,

while with the dual 28 horsepower was developed at 1950 revolutions.

The arrangement and operation of the two-spark system will prove of interest to automobilists, and the magneto utilized in connection with it is similar to the standard single-spark type externally, the only noticeable difference being that of the distributor plate. This device, however, is not applicable to the single spark magnetos. In the latter type one terminal of the secondary armature is grounded and the flow of current is from the other end of the high-tension winding to the distributor and to the spark plug, the return to the grounded end of the winding being through the metal of the engine and the maneto.

In the dual member, the terminal of the secondary armature winding is not grounded on the armature core, but is led out to the second distributor, which in turn is connected to the second spark plug. The flow of current is therefore from the high-tension winding to one of the distributors and its spark plug, through the metal of the engine to the second spark

vance with the double spark, one set of plugs may be cut out and the remaining members will operate with an advance of 15 degrees, which is considerably less than required with the single system. This cutting out of the extra ignition brings about a variation of speed and is adaptable to fixed ignition as the magneto is set for the maximum advance of 15 to 18 degrees and the retarded spark effect brought about by the switch. Normally, however, the magneto is produced with a variable advance of 20 degrees, which is sufficient for the extreme lead required.

The device is produced in types corresponding to the Bosch D and D R magnetos and for engines from one to eight cylinders. The principal dimensions are similar to those of the single-spark magnetos of corresponding types, the only difference being in the overall dimensions on account of the extra distributor plate. They are manufactured in the independent as well as dual form and the method of wiring these systems is depicted in the accompanying diagrams which show the method of cutting out or in the extra ignition by changing the position of the switch lever.

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CAUSES OF HARD STARTING.

In these days of low test gasoline starting a motor that has been exposed to the cold for any great length of time is often exceedingly difficult and more especially so if the carburetor be set improperly. There are numerous reasons why the engine will not start saily under such conditions and invariably if the randed motorist begin to change the adjustment he uilds up trouble unless he be well versed in the aechanism of the device. When the carburetor has been giving good results and the motor has previous-started fairly easily, it is bad practise to allow anyne to tamper with it, especially if he have only a air acquaintance with carburetion, which is some-limes dangerous knowledge.

It must be remembered that warm weather has he effect of not enough air while cold has directly he opposite and these conditions should be taken nto consideration. Assume that when the ignition is h perfect order and the adjustment of the carbuetor is unchanged, the motor does not start. These onditions would indicate: Water in the fuel, poor trade of gasoline, an empty tank or clogged pipes. If the vaporizer be at fault, it will flood, and this may so due to three reasons—a leaky float, a needle valve which does not seat, or a change in the adjustment of the needle. The spraying nozzle may be clogged and /while there is fuel in the float chamber the suction of the piston is not strong enough to displace the foreign element, the result being that no vapor is generated. Another common trouble is that the float is too low, allowing only a little fuel to come out of the spraying nozzle.

And it may be that the air adjustment is changed, either by some person trying to improve conditions unknown to the owner, or because the locking parts have worked loose. Sometimes dirt will collect in the air valve holding it open, and it has been recorded that the throttle valve remained closed. All these conditions will make cranking futile.

If after injecting gasoline into the cylinders the motor starts but stops after a few explosions it may be due to water leaking into the cylinders or in the fuel, but it is more often caused by too light an adjustment of the air valve. This member may be tested by pushing it open and admitting more air, or by partially closing the opening and reducing the supply, and noting the results. Too much air or not enough gasoline will create hard starting conditions.

In adjusting a carburetor it must be remembered that a black smoke denotes an excessively rich mixture and this is noted easily by the strong, pungent odor. If the cut-out be so arranged that the flame of exhaust may be seen the operation will be facilitated. The blue flame denotes too much fuel while a vellow shows too much air. The proper color is a purple. In connection with winter driving too much emphasis cannot be laid upon the necessity of straining the gasoline and the occasional opening of the petcock on the filter.

In excessive cold weather, and especially if an anti-freezing solution of alcohol be not employed, the fan belt should be disconnected and a portion of the radiator covered. The size of the cover will depend upon the motor, inasmuch as some heat easily while others remain cool. It is reasonable to presume that

an engine that warms up but slightly in hot weath will be cold in winter, especially if driven at spe in the teeth of a freezing wind.

HAND POCKETS IN ROBE.

A motorist who drives considerably in the wint has devised pockets in the robe for the protection the hands of the occupants of the car. A strip the same material of which the robe was made w attached to the outside of the member and sewed ho zontally, the ends being left open. The operator robe was provided with a similar fitting so that of hand was kept warm while driving. Those who hattempted to tuck the hands under a robe and at the same time wrap up in it snugly will appreciate the new device.

WINTER CARE OF TIRES.

Tires require care in the winter more so than during warm weather because of the moist condition that exist, especially if there be snow upon the ground if the tread of the shoe be cut so as to extend into enear the fabric, the abrasions should be vulcanized else the water will find its way to the fabric, rotting the material and the inevitable blowout will occur the friction set up in running will generate a heath at will melt the snow. Shoes should not be leadered with moisture and allowed to freeze to the floor of the garage.

WILL MANUFACTURE SPARK PLUGS.

The Hartford Machine Screw Company, Hartford, Conn., which has for years made the metal parts for spark plugs for other manufacturers, is about to engage in the manufacture of what will be known to the trade as the H. M. C. spark plug, and later this will be followed by another at a cheaper price. It is stated that the quality will be high and the prices such as will command attention.

ANNUAL MEETING OF DANBURY CLUB.

At the annual meeting of the Danbury Automobile Club, Danbury, Conn., held recently, matters pertaining to road improvements were discussed, especially the proposed highway between Danbury and Newton which has been surveyed. The officers elected follow: President, Jacob C. Irving; vice president, Frederick T. Joy; secretary, H. T. Holt; executive committee, John R. Perkins, Frank A. Cantwell and Harry B. Mallory.

FANS PRESENT WALSH WITH CAR.

The Chicago admirers of Edward Walsh of the Chicago American baseball team have given him a touring car in recognition of his good pitching in the recent series with the Chicago National team. It is a 1912 Stevens-Duryea, made by the Stevens-Duryea Company, Chicopee Falls, Mass., and on the inside of the dash is an inscription plate describing the reasons for the gift.



High Grade Motor Cars

Nothing careful thought and long experience can possibly foresee has been omitted in making Knox Cars the utmost in automobile value.

More than ever have the little detailed refinements been worked out for the comfort and convenience of the "motorist who knows" while the equipment—always exceptionally generous—has again been enlarged to make the complete car.

Three different chassis with a wide variety of body designs are offered this coming year.

The Model R, 4-cylinder, 40 H. P, chassis is built in three different wheel base lengths and twelve body designs, covering the whole range of pleasure car service.

The Model S, 6-cylinder, 60 H. P. chassis is built in two different wheel base lengths and eight body designs, suitable for cars of surplus power and speed

For 1912 the Knox Company offer either model equipped with the new Knox long-stroke motor having the standard 5-inch bore and 5½-inch stroke, giving greater pulling power at low speed for those who wish this type of motor.

Between the Model R and Model S the Knox Company announce the new Model R-45 having the new long-stroke 4-cylinder motor fitted to a 126-inch wheel base. This model is especially designed to meet the needs of closed car service where lower engine speeds and greater pulling power are most desirable.

To meet the only logical solution of getting in and out of the driving seat on the righthand curb side of the automobile, the Knox Company are fitting all models with the center gear shift and emergency brake lever. The spare tire carried on the righthand running board of most motor cars, which makes it necessary to walk around through the mud to the lefthand entrance, is carried fully inflated in a special tire trunk slung under the trunk rack in the rear of the body. This gives free access to a righthand entrance. And for those who prefer the lefthand position of the steering wheel this position is offered as an option on the Models S and R-45.

It has been difficult to improve the standard Knox models. The well-known Knox power plant with its tremendous motor energy for the size of the cylinders, the simple, frictionless Knox transmission and the well-designed chassis features have been through the fire of many seasons' service in private use and under the most gruelling of contest conditions. And so the Knox Company have been able to add only those little refinements which make for the convenience and comfort of the motorist who has been through the game and knows what he wants through experience.



No. 829-1912 Knox Model "R" 45 6 passenger Torpedo. 126" wheel base. Price fully equipped \$3700.



No. 809-1912 Knox Model "S" 60 H. P. Raceabout, Series A. 134" wheel base. Price fully equipped \$4800.



No. 792—1912 Knox Model "R" 45 Foredoor Limousine. 126" wheel base. 7 passenger. Price fully equipped, \$4700.

THE KNOX IS BUILT TO LAST AND STAY NEW.

Our New Catalog Will Tell You More.

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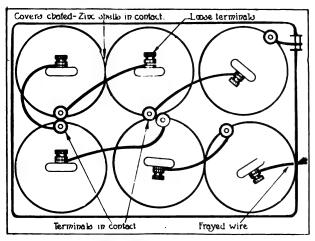
Altering Pressure Oiling System.

Enclosed please find a sketch of my two-cylin-Will you please inform me if I can car. change my oiling system to feed to the crankcase instead of to the cylinders? The oil tank is on the top of the of to the cylinders? The oil tank is connecting rods crankcase and is a pressure feed. My connecting rods do not get lubricant enough. I place a pint of oil in the crankcase and feed plenty of it to the cylinders, but after five miles the case is empty. Please inform me how to make the change.

THOMAS W. FIRTH.

Kearney, N. J., Dec. 13.

Several types of two-cylinder horizontal opposed motors utilize the same oiling system as described and in the opinion of the writer the pressure feed with leads to the working parts is a very satisfactory method. In some high speed two-cylinder motors of this type considerable difficulty is experienced in lubricating properly the conecting rods and one make in particular is recalled in which the connecting rods



Some Short Circuits Brought About by Improper Installation of Dry Cells.

burned out frequently because of lack of lubricant to these members.

In altering the system it is advisable to retain the leads to the cylinders. To obtain the result desired it will be necessary to secure a tank with four leads, two of which should be fitted to the top or cover of the crankcase and so arranged that the oil will drip directly on the connecting rods. This will necessitate the drilling of holes and tapping same in the cover for the screw check valves, similar to those fitted to the cylinders. As the feed may be regulated it is possible to adjust those leading to the crankcase to supply as much lubricant as desired.

Pressure of Acetylene,

(1322)—Please tell me if gas from carbide can be made permanent and effective when compressed, say to 150 pounds. Your correspondence column is always interesting and this subject is especially so to me.

J. E. HARRISON.

Los Angeles, Cal., Dec. 26.

Judging from an explanation of the Prest-O-Li Company regarding the pressure of its gas tanks du ing cold weather, and which appeared in the previous issue of The Automobile Journal, the pressure suggest ed should be effective.

Improving Compression.
(1323)—I have a car fitted with a five by five-inch, horsepower, air-cooled motor. The machine has been is giving excellent service, but I find the compression not and never has been as good as it should be. leakage there is appears to be past the rings, the valvand cages being tight as well as all other connection. The pistons are fitted with three rings of the lap type and the cylinders cannot be scored as the motor ha never been run without an amply supply of oil. The ca has been in service two seasons during which time th engine has never been overheated. I believe the power could be materially improved with a corresponding decrease of gasoline consumption if the compression were as it should be. Could I improve the compression by fitting new rings or would the cylinders have to be reting new rings or would the cylinders have to bord? I have been told that an air-cooled motor could not be built with as perfect compression as a water cooled engine on account of the tendency to overhead is this a fact? I have never had the least trouble about overheating as yet. I cannot understand why a leakage of gas and consequent waste of fuel should be necessar in an air-cooled motor. If low compression is a require ment of air-cooling why not make all parts gas tight an increase the clearance sufficiently to make the compression as desired? I would greatly like to have the compression as desired? pression in this motor improved if I can do so without me through your columns will be appreciated greatly

J. R. NICHOLS.

Madison, Neb., Dec. 25.

If the compression leaks past the rings the fitting of new rings should improve conditions. It is no probable that the cylinders are scored, but they may be worn out of true and this may allow the gas to ea cape as stated. This may be determined by examinate

If the compression be poor and due to leaks a suggested, new rings if properly fitted would increase the power and less fuel naturally would be require because of the better compression. As to reborin the cylinders, that would depend upon their condition

There is no reason why an air-cooled motor can not be built with good compression; in fact, the write knows of instances where cars fitted with these en gines would start from the seat after standing man hours.

Leakage of gas and a waste of fuel is not essential nor is it necessary with any well designed motor. Goo compression is desired and this can be brought about only by the cylinders being bored properly and piston and rings fitting as they should. No doubt new ring would improve this engine.

Deterioration of Dry Cells.

(1324)—What should cause the middle battery in set of five to deteriorate in about one-half the time takes to kill the balance of the cells when the car not in use?

JOHN J. HANEEN.

The cell in question may have been short circuited

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mporarily or it may have been a fault of the battery.

ry. cells sometimes act in an erratic manner and it is

ot uncommon to discover one or more members in a

t have deteriorated as stated. Even new batteries
ill lose their energy in time and this dissipation de
nds upon conditions. The writer has frequently

scovered a cell which gave a low reading in amper
ge while the other members were found to be in good

ondition. When batteries are installed carelessly

nort circuits are likely to follow and the accompany
gillustration presents several examples of this kind.

Bore and Stroke Motor,

(1325)—What is the proper allowance to make for roke in figuring motor power? For instance: Which could develop most power, other things being equal, a 25-inch bore and five-inch stroke four-cylinder motor one having a 3.75-inch bore and four-inch stroke?

F. B. STUDWELL

Lake Waccabuc, N. Y., Dec. 26.

It depends largely on what is desired of the motor. It of the motor is order to give a definite answer it would be necessary to learn exactly in what service the engine is to e used. However, the following suggestions may rove of value:

Taking it for granted that all other conditions are qual the efficiency of work performed with a gallon of fuel will not be the same at all times. Some entineers claim that the power attained does not intrease continually in proportion to the increase in the ength of the stroke, but only to a point where the rate is about 1.6 to one. This means that the energy in the charge with the growing stroke is not as efficient is at the beginning. As the burning of the charge may be said to be practically the same by a long or thort stroke, a difference in power of the short stroke actor would be said to originate in proportionate loss of heat by the overlong stroke motor.

There is, however, a difference of opinion among authorities concerning this point, especially when here is but little variation in the length of the stroke of the two motors. Some contend that as the charging surface of the cylinder with a short stroke motor in comparison to the total gas contents is less than in the long stroke engine, the consequence is that there is a relatively less loss of heat in the first mentioned.

Others hold that the principal distribution of the seat takes place at the moment of the explosion and therefore claim in respect to the heat losses that only the surface measurements of the compression chamber at that time may be considered, which, of course, layors the long stroke.

The facts appear that as far as the motors are concerned the efficiency is the same in both types, provided, of course, that the proportions are normal. To obtain full value of the expansion a certain piston speed is necessary, thus giving the short stroke motor more revolutions than the longer stroke. Therefore, before selecting the engine it is well to know the work required of it. For light cars where high speed is desired, the short stroke generally gives satisfaction, but on heavier machines the slow speed motor has many points which may well be recommended.

According to the formula of the Society of Automobile Engineers, the motors described would be rated as follows:

Three and one-quarter-inch bore and five-inch

stroke, 17 horsepower; 3.75-inch bore and four-inch stroke, 22.5 horsepower. These calculations are based upon an assumed piston speed of 1000 feet a minute.

Excessive Lubrication.

(1326)—I have been troubled with over lubrication in a car. The No. 1 and No. 2 cylinders are at fault as the exhaust valves have to be cleaned about every 350 or 400 miles and the combustion chambers are always soaked with oil. The first cylinder gives more trouble than the second. The others work properly. This fault developed after the car had been run about 1000 miles.

The lubrication is by the constant level splash with circulating pump. The oil splashers or dip pans were dipping .25 inch. I shortened these to .1875 inch, as advised by the maker of the car. It stated it were of the opinion that the pistons were too small. I have shortened the splashers to .125 inch in the No. 1 cylinder and to .15625 inch in the No. 2. This has not helped any as I can see. I have the motor disassembled but the pistons and cylinders do not show any wear.

There are four .5-inch holes through each piston about 2.5 inches from the open end. I suppose these are for lubrication. Do you think it would help this trouble if I stopped up these openings in the troublesome cylinders? Would there be any danger of these cylinders not getting enough oil? If I stopped up the openings would it be necessary to cut grooves on the piston as suggested in an article appearing in your magazine some time ago?

GEORGE DOTTS.

Eddyville, Ia., Dec. 27.

The closing of the openings of the pistons should not be attempted unless recommended by the maker who should be able to help remedy the trouble. It may be that the pistons and rings do not fit properly as the maker suggests. It is possible that the front springs have settled and that the front part of the crankcase is lower so that oil gathers, creating an over supply. If the crankcase be not fitted with partitions this may be the trouble.

CIVIL ENGINEERS DISCUSS ROADS.

Three meetings of the American Society of Civil Engineers will be held at the headquarters of the organization, 220 West 57th street, New York City, during the progress of the Madison Square Garden show in that city, Jan. 19-20. The main subject for consideration will be that of road construction and maintenance, and all engineers, whether members of the society or not, are invited to be present. The programme follows:

Jan. 19, morning—"Drainage and Foundations," James Owen; "Fillers for Brick and Block Pavements," George W. Tillson. Jan. 19, afternoon—"Bituminous Surfaces," A. W. Dean. Jan. 20, morning—"Use of Bituminous Material in Penetration and Mixing Methods," Linn White.

ENGINEERS' ANNUAL DINNER.

The annual dinner of the Society of Automobile Engineers will be held in the Belvidere room of the Hotel Astor, New York City, the evening of Jan. 19. Of the total membership of nearly 1200, it is expected that more than half, or some 600, will sit down at the tables. The committee in charge consists of the following: H. M. Sweetland, Hermann F. Cuntz, Thomas J. Fay, Howard E. Coffin, F. J. Newman and Coker F. Clarkson.



ADULTERANTS IN LUBRICANTS.

Lubricants containing soap in quantity, resin and asphalt, or which have been exposed to the action of sunlight or air are to be avoided, according to an investigation of the effect of added fatty and other oils upon the carbonization of mineral lubricating oils conducted by C. E. Waters, associate chemist of the bureau of standards, Department of Commerce and Labor.

He states that in a previous bulletin he called attention to the fact that two straight mineral oils under investigation yielded more carbonized matter, insoluble in ether, when they were heated in brass tubes than when heated in glass tubes of the same dimensions. The reverse was true of a third oil having a saponification number indicating the presence of .5 per cent. of fatty oil. This naturally suggested the advisability of determining the amount of carbonization of a straight mineral oil and of the same oil with known amounts of other constituents, such as lard oil, resin oil, tallow, etc. Tests confirmed the previously made statement that the insoluble precipitate is an oxidation product.

In his discussion of results, Mr. Waters states that in considering the percentages of insoluble obtained on heating any given sample of oil, it is evident that there are causes of variation that may or may not be capable of elimination. An electrically heated bath is now being made to obviate air currents as a source of variation and also irregular heating. There is no apparent connection, he states, between the amounts of insoluble, evaporation and "varnish." As to catalytic action, influencing the amount of insoluble, which was hinted at in a previous paper, a tabulation of the present results fail to give any certain evidence of it.

He states also that the addition of various oils and other substances to a straight mineral oil affects the amount of carbonization, as measured by the percentage of precipitate thrown out by petroleum ether, in various ways. The addition of a small amount of ferric oxide to a straight mineral oil greatly increased the amount of carbonized matter formed. It is not impossible that the fine metallic powder resulting from the wearing of the piston and cylinder walls may become oxidized and then further the carbonization of the lubricant.

He warns against the conclusion, from the low results obtained with mixtures containing tallow, lard oil, etc., that the addition of these oils is to be recommended. The presence of the fatty acids resulting from the decomposition of the oils may greatly increase the corrosion of the cylinder, and in actual practise cause as much carbonization as would the direct addition of ferric oxide. Mr. Waters intends to make a series of determinations by heating the mixture with polished strips of iron, brass and other metals.

NOBBY TREAD TIRE FACTS.

The United States Tire Company, New York City, is issuing some interesting information regarding the application and use of its nobby tread tires. The facts are told in story form and are contained in a neat booklet of 16 pages.

PRIVATE DISPLAY FOR KISSELKARS.

Because it has been found impossible to display the full line of KisselKars, made by the Kissel Motor Car Company, Hartford, Wis., at the New York shows it has been decided to hold a private exhibition in that city, throughout the entire month of January. Fee Eastern people realize the number of models produced by this concern, and the show now being held at 137-141 Madison avenue, corner of 31st street, will present no less than 25 different cars, including all of the pleasure chassis with some 15 styles of bodies. It addition there are on view all of the truck chassis fitted with 12 different types of bodies, as well a chemical fire wagons, police patrols and ambulances

As is well known, the capital of the company was increased in 1911 from \$400,000 to \$1,000,000. The factory floor space also was doubled. This places the concern in an enviable position with respect to it ability to produce any desired type of pleasure or commercial vehicle. It is believed that the special Kissel-Kar display, now in progress, will give the people of the East abundant opportunity to study the line with most satisfactory results.

ABBOTT-DETROIT "BULLDOG" AT ST. LOUIS.

With the speedometer showing a mileage of 39, 198, representing the total distance travelled, the Abbott-Detroit "Bulldog," Dr. C. G. Percival, assist ed by George D. Brown, driving, reached St. Louis Mo., recently. When the car rolled into the city it was loaded with Missouri mud. It required eight days to negotiate 312 miles and much of the time the machine was operated on the low gear owing the heavy rains. From St. Louis the party proceeded to Detroit and thence to New York City for the Grant Central Palace show, after which the tour will be resumed to Chicago, for the exhibition in that city.

REPORTS BUSINESS OUTLOOK GOOD.

Smalley Daniels, manufacturers' direct sales representative in Boston, who has returned from a two months' western trip, visiting Pacific Coast jobbing centres, reports that the trade is in a most flourishing condition and that indications point to an unusually prosperous season. He states that over 800 carloads of automobiles were unloaded in Los Angeles during the month of November.

KNIGHT VISITING AMERICA.

Charles Y. Knight, inventor of the Knight sleeved valve motor, is visiting New York City, where he will attend the motor car shows. He plans to inspect the leading exhibitions before returning to Europe, and will remain here a month. He is accompanied by his partner, L. B. Kilbourne of Chicago, and will attend a number of meetings of automobile engineers while in New York. At Chicago he will be present at a conference of the mechanical experts of that city. He has been the recipient of numerous invitations to make addresses upon the subject of his patent.





"Always There"

Official Statistics Prove CHAMPIONSHIP OF SPLITDORF

Official statistics of the American Automobile Association Contest Board for the competitive season of 1911, place SPLITDORF IGNITION as the CHAMPIONSHIP IGNITION.

Stripped to bare figures, the showing of SPLITDORF EQUIPPED CARS was:

ROAD EVENTS	TRACK RACES	HILL CLIMBS	BEACH RACES
10 Firsts	84 Firsts	45 Firsts	29 Firsts
7 Seconds	56 Seconds	24 Seconds	20 Seconds
7 Thirds	30 Thirds	16 Thirds	16 Thirds

No more convincing argument in favor of SPLITDORF IGNITION can be advanced—the official figures stand for all time.

But what SPLITDORF EQUIPMENT has accomplished in contest it can accomplish with equal ease on YOUR MACHINE.

Our SERVICE DEPARTMENT is at your disposal—INVESTIGATE.



Write for our Magneso catalog
C. F. SPLITDORF

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BRANCHES

BOSTON	Moto	r Mart, 220 Pleasant Street
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SAN FRANCISCO		430-36 Van Ness Avenue
DETROIT		368 Woodward Avenue
		1225 South Oliver Street
		1823 Grand Avenue
London Paris	Turin	Brussels Johannesburg



While of course it is too early to give absolutely correct results in the matter of world's records obtaining at the close of 1911, inasmuch as the Federation Aeronautique Internationale must act upon all claims of this nature before they are accepted finally, the accompanying list will serve the purpose of demonstrating the progress made along these lines. It will be noted that the last two columns of the table give the records at the close of 1911 and 1910, respectively. It ought to be explained that these figures are all subject to revision by the federation and it may be that slight changes will be noted when the official report is made public.

These marks were secured over a closed circuit. Numerous other so-called records have been made, including the remarkable cross country flight of Calbraith P. Rodgers in a Wright biplane from New York to Los Angeles. The longest cross country flight of 1910 was made by Alfred LeBlanc with a Bleriot monoplane in a 485-mile race in France. In 1910, it was considered remarkable that Julien Mamet was able to carry two passengers in a Bleriot monoplane 57 miles over a closed course. In 1911, Roger Sommer carried six passengers in his Sommer biplane from Rheims to Mourmelon, France, and return, a distance of 30 miles. As many as 12 persons have been carried aloft at one time during this year.

Jan. 1, 1911, the international cup was held by Maurice Tabuteau with a Maurice Farman biplane, having covered 362.66 miles. Jan. 1, 1912, it would by M. E. Helen with a Nieuport monople having flown 783 miles under the new regulation which permit landing for fuel so long as a prescript average of speed is maintained.

Claude Grahame-White of England won the int national Gordon-Bennett cup in 1910 with a Blet monoplane. In 1911, it was taken by Charles Ten Weyman of America in a Nieuport monoplane.

The Coupe Femina, offered for the longest at tained flight by a woman in France, was won in 11 by Mlle. Helene Dutrieu in a Henri Farman bipla flying 103.8 miles in 2:35:00. Mlle. Dutrieu retained the trophy for another year, having flown 158 ml in 2:58:00 at Compeigne, France, Dec. 31. As the case in 1910, Mlle. Jeanne Hervieu was seed in the competition, her mileage being 174.

There was no hydro-aeroplane flying during 1911 the successful machine of this design being a product of 1911. Harry N. Atwood in a Burgess-Curtis hydrogeneous claims the duration record with this to machine, with a flight of 130 miles from Lymass., to Providence, R. I., Dec. 21, his time be 2:41:00. Lieuts. Theodore Ellyson and John H. Ters hold the distance record with a Curtiss hydrogeneous in a flight of 145 miles from Annapoment, to Buckroe Beach, Va., in 2:27:00, Oct. This also is a duration record with passenger.



Bleriot Monoplane Limousine, Built in France by Louis Bleriot for Henri Deutsch and Flown Successfully Georges Legagnaux.

An accompanying illustration presents the new priot monoplane limousine recently completed by us Bleriot of France for Henri Deutsch, the well own sportsman of that country. It was given its tial trials recently, and performed satisfactorily in hands of Georges Legagnaux.

coachwork is very comfortable, being fitted with cane seats for four persons. Mica windows are fitted, and some of them are so arranged at the bottom of the machine that a full view of the country may be obtained. The aerial limousine is a decided novelty, although thoroughly practical in every respect.

MPARISON OF WORLD'S AEROPLANE RECORDS AT CLOSE OF 1910-1911

	Speed	According to Distance, Av	lator Alone.			me	
Miles	Machine	Aviator	Place Date	16	1911 2:18.4	1 910 2:34 6	
3.1 6.2	Nieuport monoplane	Edouard Nieuport Edouard Nieuport	FranceJune	21	4:30.2	2:34.6 5:30.9	
12.4	Mieuport monopiane	Raouara Nieuport	, FranceJune	16 16	9:14.8 13:53.8	11:04.8 16:38.3	
18.6 24.8	Nieuport monoplane	Edouard Nieuport Edouard Nieuport	FranceJune	16	18:31.6	22:12.5 27:51.2	
31.0	Nieuport monoplane	Edouard Nieuport	.FranceJune	16	23:10.0 46:27.4	27:51.2 1:01:04.7	
62.1 93.2	Nieuport monoplane	Edouard Nieuport Charles T. Weyman	England July	16	1:11:36.2	1:43:19.6	
124.2	Nieuport monoplane	M. E. Helen	FranceAug.	26	2:13:35.4	2:18:30.6	
	Speed Accor	ding to Distance, Aviator a	nd Oue Passenger.				
3.1	Nieuport monoplane	Edouard Nieuport	.FranceJune	12	2:52.8	7:31.2	
6.2 12.4	Nieuport monoplane	Edouard Nieuport . Edouard Nieuport	France June	12	5:44.4 11:23.2	15:14.4	
18.6	Nieuport monoplane	Edouard Nieuport	.FranceJune	12	17:02.4	22:56.4	
24.8 31.0	Nieuport monoplane	Edouard Nieuport Edouard Nieuport	France June	$12 \dots \dots 12 \dots$	22:35.8 28:09.8	29:40.0 38:19.4	
62.1	Nieuport monoplane	Edouard Nieuport Edouard Nieuport	.FranceJune	12	56:47.4	1:16:51.0	
93.2 124.2	Nieuport monoplane Etrich monoplane	Edouard Nieuport Lieut Heinrich Bier	. FranceJune . AustriaOct.	12	2:05:49.0		
		ing to Distance, Aviator					
6,2		Edouard Nieuport		9	6:00.0	10:18.8	
12.4	Nieuport monoplane	Edouard Nieuport	. France March	9	11:59.4 17:52.6	21:14.0 31:53.2	
18.6 24.8	Nieuport monoplane	Edouard Nieuport Edouard Nieuport	France March	9 9	22:44.4	42:32.6	
31.0	Nieuport monoplane	Edouard Nieuport	.FranceMarch	9	29:87.4	52:56.2	
62.1	Nieuport monoplane	Edouard Nieuport	.FranceMarch	9	59:08.0	• • • • •	
		ding to Distance, Aviator	_				
6.2	Deperdussin monopla'e.	Guillaume Busson Busson	. France March	11	6:05.0 12:13.6		
12.4 18.6	Deperdussin monopia e.	Guillaume Busson	. France March	11	18:20.0		
24.8	Deperdussin monopla'e.	Guillaume Busson	. France March	11	24:24.6 30:35.4		
31.0 62.1	Deperdussin monopla'e.	Guillaume Busson Guillaume Busson	.FranceMarch	11	1:01:32.0		
		ling to Distance, Aviator					
3.1	Deperdussin monoplaje.	Guillaume Busson	.FranceMarch	10	3:34.0		
$\begin{array}{c} 6.2 \\ 12.4 \end{array}$	Deperdussin monopla'e. Deperdussin monopla'e.	Guillaume Busson Guillaume Busson	FranceMarch	10	7:08.0 14:00.6		
	20,000	Speed Regardless of Dista					
	•			0.1	M.P.H. 82.7	M.P.H. 71.6	
GANGAT	Nieuport monoplane	Edouard Nieuport Edouard Nieuport	France June	$\begin{array}{c} 21 \dots \dots \\ 12 \dots \end{array}$	67.1		
sengers	Nieuport monoplane	Edouard Nieuport	.FranceMarch	9	63.9 59.8	• • • • •	
sengers	Deperdussin monopia e. Deperdussin monopia e.	Edouard Nieuport	.FranceMarch	10	54.2		
		entest Distance Without Al					
or alone	Nicurart manaplane	.Armand Gobe	Erenes Des	9.4	Miles 462	Miles 362	
senger	Etrich monoplane	Lieut, Heinrich Bier	.AustriaOct	24	215	141	
sengers	Etrich monopiane	eut Heinrich Bier	. Austria Oct.	4	69 31	57	
sengers	. Deperdussin monopla e.	Guillaume Busson Guillaume Busson	FranceMarch	11	15	::	
Greatest Duration Without Alighting,							
or alone	.M. Farman biplane	Eugene Renaux	.FranceAug	71	Time 2:12:00.0	Time 8:12:47.4	
senger	.Etrich-Rumpler mono	Suvelack	.GermanyDec	8	4:34:00.0	3:19:39.0 1:38:40.0	
Bengers	. Warchalowski biplane.	Lieut Heinrich Bier Adolph Warchalowski	AustriaOct.	1	1:05:18.3 45:46.0	1:38:40.0	
sengers	.Deperdussin monopla'e.	Guillaume Busson	.FranceMarch	10	17:28.2		
Grentest Altitude. Feet Feet							
or alone	Bleriot monoplane	.Roland Garros	FranceSept.	4	13,950	10,745	
HADOAF	Danardugein mananla's	Lieut, Heinrich Bier	France Dec	29	$9,600 \\ 3,916$		
Bengers	.Edica monopiane	Dieut, meimiem biel	.Austria.,, sept,	40	0,010		

The chassis was modified somewhat over the usual riot design, inasmuch as there is an elevator as 1 as a tail on this machine. The 100 horsepower ome motor and propeller are arranged at the rear the body work, while the operator has a seat simito that of a chauffeur on the automobile, with ce for an additional passenger at the side. The

The Italian army does not appear to be the only armed force to possess an aeroplane, dispatches from Pekin, China, furnishing the information that the republican forces are utilizing a flying machine, which was flown recently from Shanghai to Wu Chang, a distance of some 400 miles, by a French expert and an experienced Chinese operator.



E. M. Harrison has been making tests at Indianapolis, Ind., with the Shur-Go self-starting device as applied to aeroplanes. The appliance was invented for use on automobiles, but Mr. Harrison conceived the idea that it might prove practical in aerial work, and his trials are said to have borne him out.

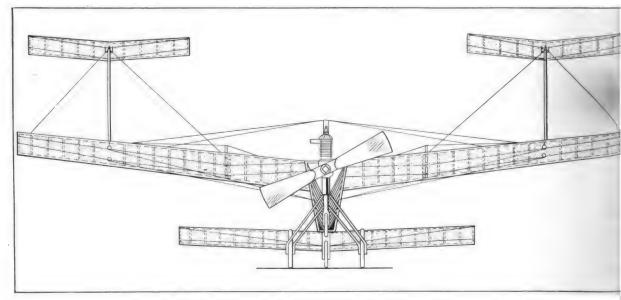
The Wright Company, Dayton, O., announces that the 1912 model Wright biplane will be fitted with the new stabilizing device tried out at Kitty Hawk, N. C., during the past summer. At present this will be applied only for lateral stability, it being desired to give it still further tests before definite plans are laid for its use to secure longitudinal balance. Another new feature of the 1912 models will be the 50 horsepower six-cylinder engine, replacing the old 35 horsepower four cylinder. In addition a muffler will be fitted.

Nels J. Nelson of New Britain, Conn., who has

of time while making necessary repairs to the mo The public has never seen the Tillinghast aeropa and the inventor seems little disposed to take out into his confidence concerning its details of a struction.

The new world's record for duration with pass ger, set by Suvelack in an Etrich-Rumpler monople at Johannisthal, Germany, last month, was anot victory for the Bosch magneto. The engine used an Aeolus, Bosch-equipped. Suvelack and his passenger flew for 4:34:00 without alighting.

Within the past week two well known aviate Harry Atwood and James V. Martin, have annound their intention of flying across the Atlantic ocean the spring. It is anticipated that the start will made from Newfoundland and the objective powill be the coast of Ireland. At first thought, would appear that the task was somewhat presented.



Patent Drawing of Aeroplane Invented by Wallace E. Tillinghast, Worcester, Mass., Illustrating Novel Meth of Stabilising,

been making a number of successful flights in a biplane of his own design during the past few months, announces his intention of creating a hydro-aeroplane early in 1912.

Presented herewith is a patent drawing of the Tillinghast aeroplane, with which Wallace E. Tillinghast of Worcester, Mass., claims to have made many long distance night flights. It will be seen that the machine may be classed as a monoplane. The short plane on a level with the landing chassis is the elevator fitted underneath the rear rudder, while the two small wings above the main plane are designated as balancing wings.

Mr. Tillinghast claims to have flown a machine of this design with a 125 horsepower engine, and to have carried searchlights on his night flights. The machine is said to have remarkable stability, so much so that it has been possible to remain aloft for long periods tious, inasmuch as the distance is practically is miles. However, in view of the results accomplish during 1911, it is hardly possible to forecast the access or failure of any flying ambition before the tempt is made.

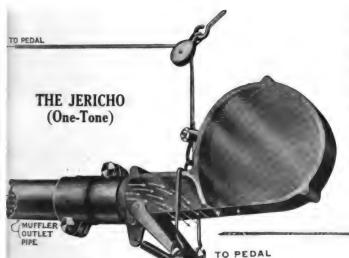
The committee of the Aero Club of America hing in charge the arrangements for the proposed ternational show in the new Grand Central Pals New York City, May 9-18, practically has made rangements with foreign designers for the display the Breguet biplane, Paulhan-Tatin aerial torp and Nieuport monoplane.

The Queen Aeroplane Company, New York Cannounces that Grover C. Loening is preparing a sign for an aeroboat which it will construct. I craft, it is explained, will be more of a boat wings than an aeroplane with floats.

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Tericho ONE HORD TUBLICE CHIME HORD

The Signal of a Gentleman-Warns Without Offence



Assurance against accidents is infinitely better than accident insurance. The ordinary bulb horn is not enough—either on winding country roads or on noisy city streets. The Jericho, on the other hand, is just enough—the perfect motor car signal—always on the job and doing its work with 100 % efficiency.

You can pay more but you cannot get more—except battery charges and maintenance charges. It is the best horn at any price—and has no battery charges.

Both Jericho and Jubilee have three points of supremacy:

1. EFFICIENCY

A loud, clear signal whose mellow tone "warns without offence." The only exhaust horn that cannot clog.

2. SIMPLICITY

Easily attached to any car and operated by foot pedal, leaving both hands free to run the car.

3. ECONOMY

Low purchase price. Is operated by the exhaust. No batteries, etc., needed. Absolutely no maintenance cost.

Equip your car with a Jericho or Jubilee and motor without anxiety.

MUFFLER

OUTLET PIPE

Jericho costs, \$7, \$8, and \$9, according to size. Jubilee costs, \$8, \$9, and \$10, according to size.

Sold by all dealers or direct from us. Send for our free BOOKLET E about Jericho and Jubileel and other auto accessories.

THE RANDALL-FAICHNEY CO.,

BOSTON, MASS.

THE JUBILEE

(Chime-Tone)

The Imperial Aero Club of Germany is planning an international aviation show to be held in the Zoological Gardens at Berlin, April 3-14. The Sloane Aeroplane Company of Brooklyn, N. Y., already has filed its intention of making display.

On the last day of the year Robert G. Fowler, who is crossing the continent with a Cole-engined Wright biplane, arrived in New Orleans, La. His course from that point will be by way of Mobile, Ala., and Atlanta, Ga., thence to New York City.

The Curtiss Motor Company has been incorporated at Hammondsport, N. Y., with capital of \$600,000, the directors being Glenn H. Curtiss, Monroe Wheeler, Jerome Fanciulli, G. Ray Hall and Philip B. Sawyer. It is understood that the new concern will take over the business of the various Curtiss companies heretofore organized, including the Curtiss Aeroplane Company and the Curtiss Exhibition Company, and will continue the manufacture of Curtiss biplanes and hydro-aeroplanes on a much larger scale than formerly.

GAS TANKS IN EXPORTING.

The Prest-O-Lite Company, Indianapolis, Ind., is notifying the trade that when automobiles are exported it is necessary to certify on the steamship bill of lading that no gasoline, water or gas remains in the tanks of the cars. This necessitates the opening of cases in the event that Prest-O-Lite tanks are shipped complete with gas, and the draining of the latter, and its being shipped separately from the machine, the steamship companies refusing to accept full tanks in the holds of the vessels even where the crate in which the car with the tank on is boxed up completely.

In order to prevent this complication and avoid breaking open the crate as well, the company suggests that when shipping to foreign countries the consignee take the precaution of placing an empty tank on the car, and pasting a conspicuous label on the crate to that effect, certifying to this condition in the bill of lading. The company announces that any of its branches will supply empty tanks and where this is not convenient the matter will be taken up by the sales department, arrangements being made to provide empty containers. The Prest-O-Lite concern suggests that tanks be not shipped to countries except where they may be exchanged and that a list of such places will be furnished the manufacturer upon application. The company maintains many foreign branches.

JERICHO AND JUBILEE HORNS.

The pleasure of motoring is greatly increased if the operator have absolute confidence in the warning qualities of the horn with which the car is equipped. It is maintained that the Jericho and Jubilee devices, manufactured by the Randall-Faichney Company, Boston, possess the ideal quality of efficiency, combined with low first and maintenance cost. They are operated by the exhaust by means of the foot, leaving both hands free to run the car. It is

further claimed that the tone is such as to be meffective for both crowded city streets and winds country roads, being so adjusted as to sound a decountry note in heavy traffic, or a long, penetraticall in the open country.

MAC-KAE UNIVERSAL TERMINAL.

The Universal terminal, brought out by the Markae Manufacturing Company, 185 Amory size Jamaica Plain, Mass., consists of a cylinder compose of insulating material in which is threaded the ple electrode, which in turn is provided at its end with brass jaws elliptic in form so as to be slipped eas around the wire or plug and hold it securely. What the jaws are fully extended the terminal will give extact on a plug through the top cap in the event the threaded post being broken off accidentally. I close the jaws it is necessary simply to turn it threaded fibre sleeve.

CONCEALING THE ACCESSORIES.

"Present day buyers of high grade cars are looking more and more for the little personal comfor and thoughtful conveniences arranged by the man facturers for their benefit," says Charles R. Cultivates manager of the Knox Automobile Compass Springfield, Mass. "The mass of accessories formed displayed all over the machine have vanished, so only the horn and lamps. Even the gear shifting lever and extra tire are invisible.

"In the present Knox equipment, which is large than previously, the extra shoe, gas tank, tools if jack may be reached easily, yet they are out of significant when not in use. The spare casing is carried in a special tire trunk slung under the rear of the body, sing free access to the operator's seat from the cubic side of the machine. Occupants of the car do have to move, as formerly, when tools, etc., are need, and in addition, more room is provided by placit these articles in a special chamber on the runnip board."

SALOM BATTERY WINS TEST.

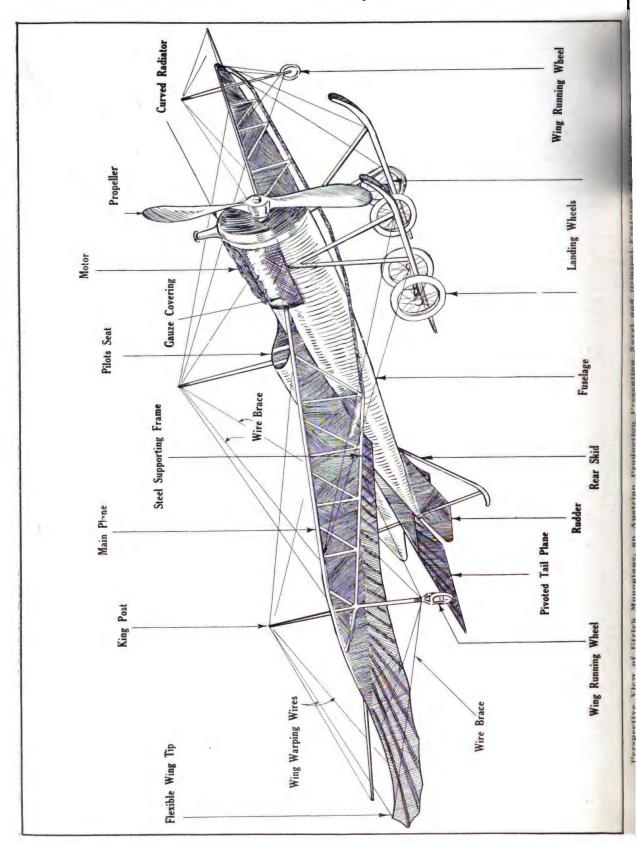
After competing with three other makes of betteries the Salom storage battery, made by the Niaga Lead & Battery Company, Niagara Falls, N. Y. cently won in a trial for electric lighting on 105 ta cabs of the Taxi Service Company in Boston, Ma The average time of the test of four cars on the side and meter lights, making 14 candlepower in a was 60 hours. The contract was made through Salom Battery Company of New England, 887 Betston street, Boston.

ORGANIZE NEW MOTOR CLUB.

The Champion Valley Automobile Club was orgated recently at Plattsburg, N. Y., and at the meet a representative of the New York State Automob Association was present and explained its advantage The following officers were elected: Preside George E. Cavanagh; vice president, Dr. A. N. He shaw; secretary, A. H. Marshall; treasurer, W. Howell.









THE ETRICH MONOPLANE.

Consideration of the Etrich monoplane of Austrian postruction is particularly timely, because of the part: has been playing in the present war between Italy nd Turkey in Tripoli. In a machine of this make, seut. Gavotti of the Italian army dropped four bombs ato the Turkish camp early in November; believed to the first bombs ever discharged from an aeroplane a actual warfare. Since this initial performance nuch work of a similar nature has been accorded to the Etrich owned by the Italian army and always with satisfactory results. It was one of these mahines in which the operators directed the gunners of the Italian navy while reducing the forts at Sciaracciat.

While very little has been known concerning the Etrich monoplane in America, it remains that Igo Etrich began his experiments in 1898, using a Lilienhal glider. In this respect, at least, he followed the example of the Wrights, although it is believed that leither knew of the work of the other.

Having satisfied himself that it was possible for man to be sustained in the air, Etrich pursued his studies by delving into every subject which would be likely to have a bearing upon the problem he had set about to solve. He examined the propulsive organs of every kind of flying animal, birds, insects, bats, flying fish, etc., and even went so far as to investigate the different species of flying seeds, those of the sycamore and pine, for instance.

This led him to try a glider of his own design, very ingeniously constructed, and of such original plan form, that at that time it was considered as bordering on the fantastical. Experiments with this machine commenced in 1904 at Trantenau, Austria, and during that year glides of three-quarters of a mile were made with ease.

It was not until 1909 that a power-driven Etrich monoplane made its appearance. This was piloted by Karl Iliner and soon captured all existing Austrian records. Since then it has undergone improvement after improvement, until today it is ranked among the most successful and most scientifically designed aeroplanes. Machines of this make have been sold to a number of European governments, and others have taken part in nearly all of the principal contests abroad this year.

In general appearance the Etrich resembles a bird. So much is this true that the Etrich-Rumpler, made under license in Germany, has been nicknamed the Taube (the Dove). The main plane consists of two wings, each of which is swept back so as in plan form

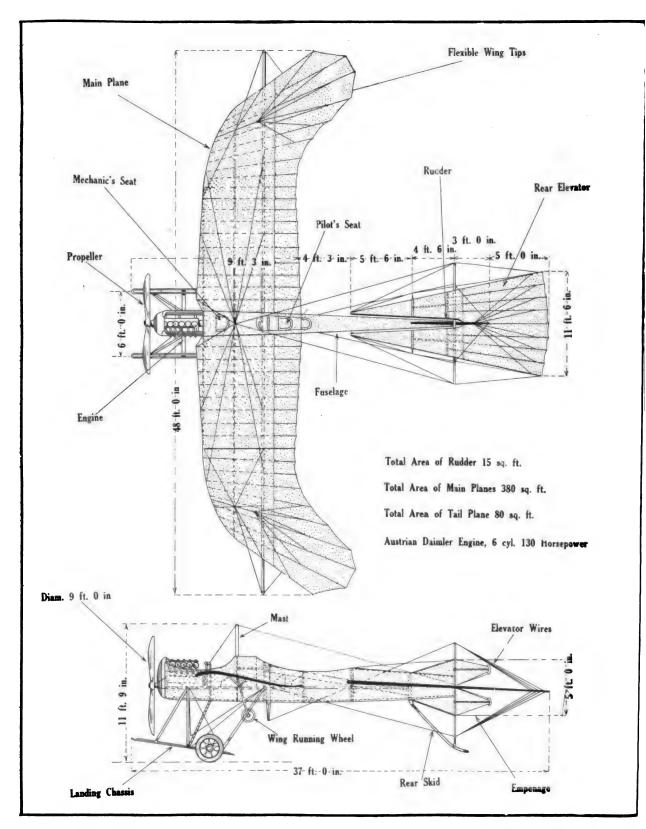
to approximate the shape of the gull's wing. The angle of incidence is at its maximum at the point at which the wings make a junction with the fuselage, decreasing until at the "elbow" it is neutral. The extremity has a negative angle, because of the fact that the trailing edge is up-turned, and the effect is held to be the same as that of a negatively inclined non-lifting tail.

The fuselage is oval in section with the greater axis of the ellipse vertical. From the elliptical radiator, mounted at the forward end, the body deepens and widens in the vicinity of the pilot's seat, and gradually tapers from this point to the tail, where it terminates in a vertical line. It is composed of steel tubing, supported at intervals by elliptical tubular steel hoops, and there also are a number of false wooden hoops introduced for the purpose of applying fabric. The covering in front is metal sheeting, while that aft of the pilot's cockpit is fabric.

The landing chassis or undercarriage has undergone repeated modification in the past, but that on the machine shown in the accompanying drawings is modelled on Henri Farman lines and has been used almost entirely during the past year. This consists of two long skids, each with a pair of rubber-suspended running wheels supported by spring radius rods. The struts leading to the forward part of the fuselage and engine mounting are of steel tubing. Steel guy wires also lead to the wing tips and empennage.

The empennage comprises two triangular vertical rudders, arranged as in the Antoinette monoplane and preceded by triangular fixed vertical fins top and bottom of the fuselage. The flat fan-shaped tail is movable as a whole, and is pivoted so as to be balanced as nearly as possible, otherwise its large size might make its movement by the pilot a matter calling for some little strength. Two forward extensions are furnished with slide brackets, in which work the extremities of a crosspiece contained within the fuselage, and for the passage of which small tunnels are arranged on either side. This crosspiece works up and down a central vertical column against the action of strong coil springs. The whole is protected in landing by the usual skid.

Perhaps the greatest interest attaches to the construction of the main plane, which is absolutely rigid, with the exception of the flexible wing tips and trailing edge. The spars are triangulated below the surface with a cross bracing of light steel tubing. This steel bracing is carried out in a most thorough manner, and it is claimed that the Etrich plane will stand a weight equal to six times that of the fuselage, landing chassis, engine, pilot, passengers, etc., when sup-



Plan View and Elevation of Etrich Monoplane, Showing Detailed Dimensions and Principal Features of Design.

orted only at the wing tips. The front portion of ch wing is surfaced on both sides with fabric. Bend the rear boom extend bamboo continuations of e ribs, which covered with a single surface of fabroform a flexible trailing edge. The camber is very ight, even at the point where the wings join the fusege, and decreases with the angle of incidence toward e tip, which presents no incidence in the direction flight.

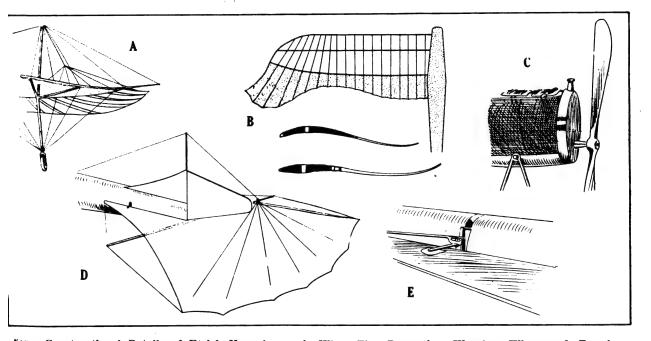
The flexible wing tips are turned up at the rear so to give the end of the wing an effective negative agle of incidence, and it is to this feature that the achine is said to owe its pronounced degree of atural stability. Lateral balance is maintained by dising either wing tip by means of a cable, which passing over a pulley located at the top of the kingpost dides up into eight wires connected with the flexible thremities. A cable passing over the lower end of meast lowers the opposite tip a corresponding mount. A small running wheel mounted on the

LECTURES ON KNIGHT MOTOR.

F. E. Dayton, sales manager for the Columbia Motor Car Company, Hartford, Conn., is delivering a series of lectures upon the Knight motor which is fitted to the Columbia cars. Beside the views of this engine those exploited since the Knight was adopted are shown by lantern slides.

NEW CLUB AT WACO, TEX.

Waco, Texas, now boasts of two motor car clubs, the McLennan County Automobile Association having been formed recently. The officers elected consist of the following: President, R. B. Spencer; vice president, Dr. N. A. Olive; secretary, Dr. I. Block; treasurer, D. S. Eddins. Contracts have been submitted the organization offering gasoline for nine cents a gallon and cylinder oil for 50 cents a gallon, a considerable reduction, it is claimed, on prices now pre-



ome Constructional Details of Etrich Monopiane: A, Wing Tip, Presenting Warping Wires and Running Wheel; B, Arrangement of Spars and Ribs in Wing; C, Engine Mounting and Radiator; D, General View of Empennage; E, Method of Mounting Tail Plane.

lower extremity of the kingpost protects the wing tip from contact with the ground. Control of elevation and lateral stability is by a rotatable hand wheel mounted at the top of a vertical column.

As standardized, the manufacture of Etrich monoplanes is in four models; a two-seated touring machine of 65 horsepower, a single-seated racer of similar power, three-seated touring with engine of 120 horsepower, and a racer of the same power for two. All utilize the Austrian Daimler engine, the larger power plant having six cylinders. In the two larger machines provision is made directly behind the engine mounting for a mechanician, whose duty it is to look after the needs of the motor, leaving the operator free to control the vehicle in flight. Communication is carried on between the two by means of a speaking tube connected to specially designed helmets.

vailing. The club intends to work in the interests of good roads and will hold a meeting for that purpose shortly.

MAGNETO TIMING SUGGESTION.

"A very slight alteration in the magneto will have considerable effect in increasing the speed of the motor," says Chas. F. Splitdorf of New York City, maker of Splitdorf ignition specialties. "Advancing the drive one tooth will increase the speed of the car about five miles an hour, but two teeth may bring about a knock. Careful experimenting is the best way to ascertain the correct adjustment."

Universal lighting and uniform laws are the prime necessities for safe and sane motoring,



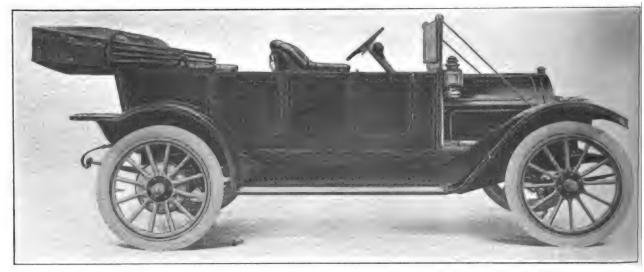
REO THE FIFTH, R. E. OLDS' PERFECTED CAR.

REO THE FIFTH is the title given by R. E. Olds to the car that the Reo Motor Car Company will build for 1912, this being the 24th model he has created, and which he believes is the best that he has produced in his 25 years' development of automobile vehicles. So satisfied is Mr. Olds with Reo the Fifth that he regards it as a sufficient achievement that did he terminate his endeavors as a designer it would be a fitting accomplishment with which to close his life's work.

The first Reo the Fifth was given a test that would never be equalled in the service of an individual when it was driven from New York to Jacksonville, Fla., by R. M. Owens as a pilot car for the recent Glidden trophy contest. The car carried a freight of passengers, baggage and confetti that weighed 800 pounds and it was required to make a schedule unusually exacting. But during the 1460 miles less

The driving shaft construction is that which has the approval of the best engineers, the rear axle is substantially built and the brakes are unusually large and powerful.

The Reo the Fifth chassis is standard. Every machine that leaves the works is identical, aside from the body equipment. The endeavor of the entire organization of the Reo Motor Car Company, with its resources and facilities, is directed toward its production. Every refinement and perfection has been carefully developed and worked out in the big engineering laboratories, under the supervision of Mr. Olds. Quite as important as this is the attention given to the selection of metals entering into the construction, each material being tested to determine its chemical constituents and its endurance and resistance, that its fitness for the use to be made of it may be established with absolute certainty. The Reo



Reo the Fifth Five-Passenger Touring Car.

than a quart of water was supplied to the cooling system and the motor was never overheated.

Designed as a Popular Vehicle.

The Reo the Fifth is regarded by the designer as a popular vehicle from every point of view. From the aspect of price it is within the reach of a very large number. Judged from capacity it will carry five passengers comfortably under any circumstances. It has a modest power rating in that it will develop more than 36 horsepower, though rated at 30. It is comparatively light in weight, but strength has not been sacrificed. It has every quality to insure efficiency without complications. It has a system for radiation that has never been found unequal to demands, no matter what the condition of service. The lubrication system is positive for every requirement and there is no possibility of derangement or failure, for there is practically a double method of distributing oil to the engine mechanism. The clutch has construction that insures long service and no possibility of harsh engagement. The transmission or speed change gearset control is simplified and is positive in its action.

laboratories are as completely equipped as are any connected with a similar industry and engaged in them is a large and thoroughly experienced staff.

The Reo the Fifth, successor of the Reo Thirty, as the 1911 model was known, is a slightly larger machine as the wheelbase has been increased from 108 to 112 inches, which increase has been divided between the space given over to the motor and body. The longer chassis makes for greater comfort and easier riding, as well as affording a means of insuring continuous engine efficiency. There has been practically little increase in weight.

Power Plant Greatly Improved.

The power plant has been refined and improved in many minor details. The purpose has been to have construction that practically will be proof against all the causes of inefficiency that may be anticipated in gas engine practise. The qualities of the motor may be noted from the detail that follows:

The cylinders are cast in pairs, following the vogue with the largest number of engine designers, and are of a high grade of gray iron. The water jacket spaces

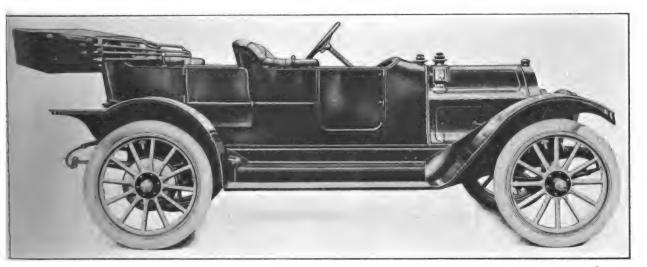
re liberal to insure effective cooling. The cylinders re of the L type with the intake valves in the head nd the exhaust valves in pockets at the right side. he water jacket is designed to have the maximum ifluence in reducing the temperature of the exhaust orts and valves, almost surrounding them. rater jackets extend nearly to the bottoms of the ylinder chambers. The cylinders are bored and aged efore being finished by grinding, this insuring gainst distortion. The pistons are cast from a uperior quality of gray iron and are turned and round accurately to size. They are fitted with three ings that are ground and lapped to fit with a bevel Each piston has three oil grooves to afford ertain lubrication of the cylinder walls. The bore s four inches and the stroke 4.5 inches, these dimensions allowing a conservative rating of 30 horsepower.

Construction of the Crankcase.

The engine base is a single casting of gray iron which is divided transversely by the walls of a recess in the case between the cylinder units. The top of this wall forms the base block for the centre main

Main Bearings Adjustable from Outside.

The construction of the crankshaft bearings is such that it is possible to adjust them from outside the engine case, it only being necessary to drop the dust pan beneath the motor. The bearings are carried in clamps surrounding the bearing metal, these clamps being secured to the engine base by two bolts. Through the bottom of the engine case two hollow bolts extend for each bearing. The ends of these bolts are square and contact with the under side of the clamps. When the bearing metal has been once adjusted a second bolt is inserted through the shaft of each hollow bolt and this is screwed into the clamp. When the inside bolt is tightened the clamp is drawn down to the lowest point and perfect adjustment is made. This does away with the use of liners or shims and permits exact adjusting of these bearings. The condition of the bearings may be determined at any time by opening the compression release petcocks and turning the motor. It is not necessary to dismantle the engine and when adjustment has been made the adjusting bolts are wired to prevent loosening.



Reo Four-Passenger Touring Car, with Detachable Baby Tonneau.

bearings and affords a firm anchorage for this member. The forward compartment of the case is open to the bottom. The after compartment is deeper and across it just below the lowest point of the connecting rod sweep is a web in which, at the right side, is a well in which the oil pump is located. This engine case has at the left side two large hand holes covered with plates retained by bolts. At the right side is carried the camshaft housing, cast integral, the transverse web before referred to carrying the centre bearing for the camshaft.

The crankshaft is of nickel steel and is carefully ground to size. It is mounted in three bearings, the two end bearings being very large and carried in journals bolted to the ends of the engine case. This construction is exceedingly rigid and substantial. The camshaft is also large and heavy and the rear end is socketed into a journal also bolted to the end wall of the engine case. The centre bearing is in the central wall, and the forward bearing is contained within the rear wall of the gear housing at the forward end of the engine case.

connecting rods are long with a view of minimizing the side thrust and the consequent wear on the cylinder walls. The connecting rods, the screws and the studs are of vanadium steel. The big ends of the rods are bushed with babbitt metal. The inspection hand holes are at the left side. The connecting rods are fitted with liberal bushings at the upper ends and the wristpins are large and carefully fitted. The right side of the big ends of the connecting rods is hinged and the left side is secured with a bolt, which is held by a clamp that is fitted into a hole in the cap and tightened by a screw. At the lowest point of the cap is a scoop that is dipped into and distributes the oil in the reservoir.

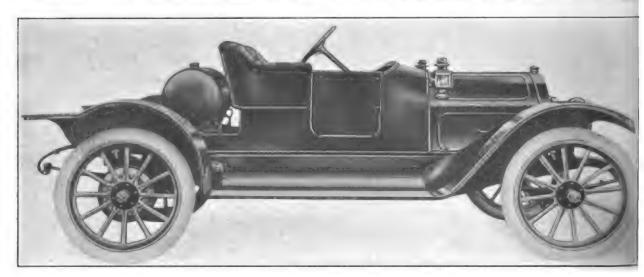
The Reo Valve Action.

The valves are actuated from the camshaft through lifts that are sleeves carrying hardened steel rollers operating within bronze guides securely clamped to the engine case. These sleeves are maintaind in correct relation by set screws in the guides. On the sleeves and covering the guides are brace caps, and into the ends of the sleeves are screwed smaller sleeves, into

which are fitted the pushrods or tappets. By turning the adjusting nuts on the sleeves it is possible to precisely adjust the movement of the valve stems and to compensate for all lost motion or for wear. The inlet valves in the head are actuated by rocker arms carried on heavy studs in the cylinder heads. It is possible to entirely remove the valve cages for cleaning or grinding the valves, or to remove carbon deposits, the openings being very large. Accessibility is one of the special merits of the Reo engine and it is possible to do nearly any work upon it without dismantling, a quality that is obvious to motorists of experience. The valve proportions also make for complete exhaust of burned gases, efficient cooling of the engine, complete charges of fuel, and certainty of power development. The position of the exhaust valve water jackets, the exposure of the springs and rods to the drafts of air, insure ample protection from the possible influences of extreme heat. The possibilities for spring weakening are practically eliminated. The operation of the valve mechanism is especially silent.

The construction of the camshaft assembly is such

ments where the connecting rods splash. The C reservoir is entirely separate from the crankcase proer. In the well in the web in the after compartment and driven by a connecting rod having an eccentr motion from the camshaft, is the oil pump, of plung type, that may be set to feed any predetermined qual tity of oil from the reservoir. This pump is positi in its action and at each revolution of the engil a charge of oil is drawn through a filter from the reservoir and forced through pipes which lead each of the three main bearings and to the camsha and water pump shaft gears at the forward end of th engine case. After the main bearings have been lubricated the oil unused is carried off by the flo and drips into the two splash reservoirs where it utilized for lubrication of the connecting rods, can shaft bearings, cams, valve lifts, valve lift rollen the cylinders, pistons and wristpins. The lubrical accumulates in the forward splash reservoir until reaches the level of a standpipe by which any surplu is returned to the reservoir under the after splas chamber. A quart of oil will lubricate the engin



Reo Two-Passenger Roadster with Fuel Tank on Rear Deck.

that it is especially accessible. It is driven off the crankshaft by spiral gearing and in turn drives a gear that operates the water pump and the magneto. When the forward end bearing of the camshaft is removed, the centre bearing loosened and the oil pump connecting rod is slipped off, the shaft may be removed entirely from its housing.

Positive Lubrication of the Motor.

The lubrication of the motor is by a combination of the force feed and splash methods. The description of the engine case stated that it was divided transversely and that there was a horizontal web dividing the rear compartment. This lower section of the rear division is the oil reservoir. Bolted to the side of the engine case at an angle of about 60 degrees is the oil filler, which contains a screen. Oil poured into this enters the oil reservoir and the quantity is indicated by the float gauge beside the filler. The capacity of the oil container is three quarts and when the gauge shows no indication there may be a quart available besides the supply in the compart-

for from 150 to 180 miles of road work. With the oil reservoir filled the motor is safe for approximately 500 miles. After the oil gauge shows no indication there yet remains a quart of lubricant besides the quantity in the splash reservoirs, and with the main reservoir empty there would still be sufficient in the splash chambers to run a considerable distance—at least any reasonable mileage—to secure a fresh supply. The pump is not in any way susceptible to wear as it is constantly lubricated and its action is absolutely certain. It is so constructed that it cleans the filter at each revolution of the mechanism.

Fan Is 16 Inches Diameter.

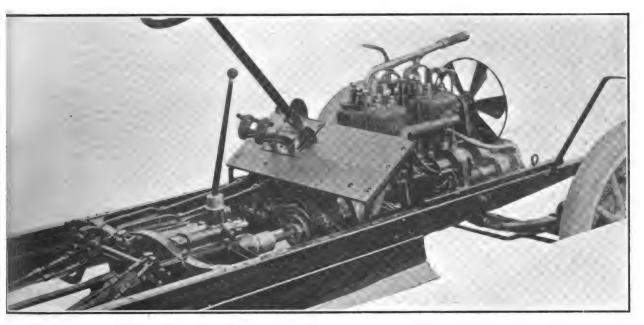
At the forward end of the crankcase are the gears driven off the engine shaft, the camshaft driving the water pump and magneto driving shaft. These gears run constantly in a bath of oil and having spiral teeth are practically noiseless, while there is no possibility of excessive wear. The forward end of the crankshaft, outside of the half-time gear, carries a pulley from which is driven the belt that turns the fan. The

n, 16 inches in diameter, is mounted in a bracket at is supported by bolts anchored in the forward linder. In this bracket is an eccentric that cares the fanshaft and its bearing, and by loosening two lits the fan may be adjusted to any desired tension the belt. The fanshaft is driven on ball bearings and there is a minimum of friction. The blades of it fan are stiffened by a metal ring encircling and tached to the ends, this preventing the possibility damage from striking an object or from crystallization of the metal.

Positive System of Radiation.

The motor is cooled by a tubular radiator of honeyomb type which is connected by large piping to the ater jackets. The leads to the radiator are from an ecentres of the water jackets of each pair of cylders with curves that insure free movement of the ater. The return piping is from the radiator to the rater pump, and through this and a pipe with easy

ders, and above this they are separated and attached to the different spark plugs. The wiring is fully protected against heat, wear, oil and the numerous causes of deterioration, while it is in every way accessible. The primary lead from the magneto is to a high grade transformer coil located on the dash. The magneto is held on the bracket by a strap and two dowel pins, and by simply removing one nut retaining the strap and disconnecting the spark lever control member will free the instrument so that it may be lifted clear. For starting the car and for a reverse a set of dry cells is carried, the current being distributed through the magneto distributor. The entire system is exceedingly simple and efficient. The spark plugs are located close to the inlet valves in the heads of the cylinders where the spark may reach full volumes of fresh gas, this making for uniform and consistent combustion. This is a change from the 1911 model in which the spark plugs were located at the extreme



Power Plant, Clutch, Transmission and Control Assembly of Reo Chassis,

curves to the base of the water jacket of each cylinder group, the pressure sending the water about the expansion chambers and the exhaust valves and causing a positive circulation where the cooling effects are most necessary. The capacity of the radiator and the water system is four gallons, which is sufficient to keep the motor at a satisfactory temperature under all conditions.

Magneto and Battery Ignition.

The source of ignition is a low-tension magneto mounted on a brass bracket at the right side of the motor and which is connected with the shaft that also drives the water pump by a universal joint, so there is no possibility of the instrument being affected by any distortion of the shaft. The magneto is carried between the arms of the motor and the side of the chassis frame and is as effectually protected as it could be in any construction. From the distributor case the four secondary leads are carried through a fibre tube mounted on a bracket between the cylin-

side of the cylinder head and insures a more satisfactory degree of ignition.

Reo Design Carburetor Fitted.

The carburetor is of Reo design, an instrument that has been carefully developed and tested under conditions that are regarded as being much more severe than would be experienced under even abnormal use. One test was the work of the pilot car during the Glidden tour from New York to Jacksonville, climbing the Blue Ridge mountains through heavy rain. on steep ascents and in deep mud. This surely was an extreme condition for service. The intake manifold is mounted high, at the tops of the cylinder groups, and the curves are easy to permit positive movement of the fuel gas. The fuel is drawn into the engine through the carburetor and a large intake that makes for a sufficient supply under all conditions of use.

The appearance of the motor is assured and its cleaning is made easier by practically all of the small

parts being nickel plated, this including the water piping, the valve levers, the operating rods, the valve caps and all the minor connections.

The engine is further improved in that the crankshaft is two inches longer, which permits the flywheel to be mounted two inches further back of the motor, this condition lessening the vibration and minimizing this effect upon the engine, while the cooling influence of the fan-bladed flywheel is considerably increased.

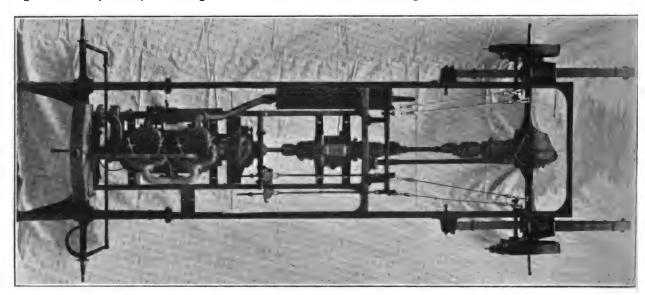
Clutch Plates Asbestos Faced.

The clutch is contained in the flywheel and is of the multiple disc type, having 24 steel discs in the assembly. The 1911 clutch was composed of alternate plates of steel and phosphor bronze, but this construction has been changed as stated, the discs being faced on one side with asbestos lining. The plates are driven dry. When the clutch is engaged the movement of the pedal is comparatively small, the compression of the asbestos facing of the plates causing a certain yet easy clutching that is free from

shaft. In the 1911 transmission the shafts were mounted on ball bearings, but in Reo the Fifth the upper shaft is carried on Timken roller bearings, to resist the thrust, while the lower shaft is on Hyat roller bearings, this having but a radial load. This construction provides means for adjustment whereve there is need. The drive shaft of the transmission is connected with the clutch by a universal joint of the pin and block type so that there is no possibility of misalignment affecting the drive. The universal join is packed with lubricant supplied to it from the transmission case. The drive shaft of the transmission is of nickel steel, bar hardened and heat treated, it chemical composition being tested in the Reo laboratories.

Two Universal Joints in Main Shaft.

In Reo the Fifth the method of drive from the transmission shaft to the rear axle is by a main shaft with two universal joints, this replacing the shaft with but one universal joint within a heavy steet tube extending from the transmission case to the



Chassis Assembly of the Reo the Fifth Without Wheels or Fenders,

harshness and the numerous faults of "crabbing." The clutch pedal is retained by a ratchet and it is actuated by the motion of the operator's left ankle, pressure downward engaging the clutch, and forward pressure from the point where the clutch is engaged applying the emergency brake. This construction insures the use of the brake without any action or thought other than pushing the clutch pedal "through," instead of the usual method of declutching with one pedal and applying the emergency brake by hand. Should the operator at any time before fully familiar with the car push the pedal "through" while engaging the clutch the result would be merely the braking of the car. There is as positive release of the clutch as there is application of the brake, two conditions that can be commended by every motorist.

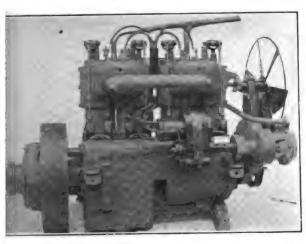
Roller Bearings in Transmission.

The Reo transmission is decidedly a well designed mechanism. The type is selective with three forward speeds and reverse and following the design of the 1911 gearset it has the countershaft below the main rear axle housing. The shaft is nickel steel and the construction is such that no distortion of the frame will in any way affect the transmission or engine. The after end of the driving shaft is constructed with the driving pinion cut integral so that there is no possibility of the pinion becoming loose, as with pinions that are keyed on. This section of the shaft and its bearing are securely clamped into the axle housing. The other end is secured in the universal joint housing bolted to the transmission case.

Rear Axle Larger and Stronger.

The rear axle is of the semi-floating type and it is larger and stronger, having been redesigned and improved in every way. The differential gears have been made larger and are cut with reference to a minimum of noise when in operation. In the differential itself are four pinions and two gears, this giving a well equalized construction. The differential ends of the axle shafts are carried on Timken roller bearings, to permit of adjustment, and to provide for the thrust load, and the outer ends of the shafts are

ounted in Hyatt roller bearings. Extreme care is ten in the construction of the gears, they being refully tested to crushing, tensile strength and



teo Power Plant Completely Assembled, Showing Means for Adjusting Main Bearings.

ther tests to insure that the quality of metal is uniorm and fully up to the requirements. The rear xle is maintained in perfect alignment by a heavy ouble torsion rod with spring buffers to compensate or any streess upon the driving mechanism. This od has anchorage to the rear of the sub-frame. The adiator, power plant, clutch, and transmission are arried in a sub-frame which abundantly protects them ill against cramping should the frame of the chassis become distorted at any time.

Chassis Frame and Springs.

The chassis frame is of pressed steel channel section with stout cross members and ample gusset plates, with the sub-frame carried well within the side members, the centre member carrying the torsion rods and the brake cranks. The frame is mounted on half-elliptic springs forward, these being of liberal length and width. The rear springs are semi-elliptic, the upper half being secured to the side of chassis frame, the forward end of the lower spring being mounted in a shackle on the side of the frame. This construction places the springs outside of the frame and close to the ends of the axle, which makes for greater steadiness and ease in riding.

Front Axle, Wheels, Tires, Etc.

The front axle is a drop steel I section forging of large margin and the assembly is with the tiebar behind the axle to afford protection against striking obstructions in the road. The wheel spindles are fitted with Timken roller bearings, this being in accordance with the best approved practise. The wheels are of the artillery type, of second growth hickory, 34 inches in diameter and are equipped with 34 by 3.5-inch tires. All the Reo the Fifth cars are fitted with quick detachable rims. With the light weight of the car the tire maintenance is certain to be extremely moderate.

Steering Wheel and Control Levers.

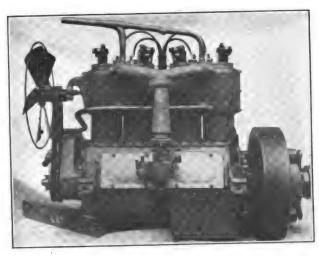
The control of the car is somewhat unusual, as may have been noted in the description of the clutch. The steering is by means of a gear and sector located at the left side of the frame and mounted on a brack-

et. The sector is carried in a slide and a spring inserted in a sleeve forces a buffer against the sector so that it is always in correct relation with the gear on the base of the steering column. The carburetor throttle lever is at the right of the magneto spark lever at the left of the steering column. The ends of these rods are mounted in sleeves and bear on cones, a desired degree of friction being maintained by springs so that the lever rods are held in any position they may be set instead of the usual form of notched quadrant. The levers are under the steering wheel and they may be moved with the finger tips without effort. Adjustment of the gear may be made as desired without difficulty.

Pedal Controls.

The clutch pedal has been described so far as its use with the clutch is concerned. Beyond the engagement and release of the clutch it serves to actuate the emergency brake which controls a set of brake shoes external expanding in each rear wheel brake drum. This differs with the former system in which the act of setting the emergency brake released the clutch, the brake being operated by a hand lever at the side. The service brake is controlled by a pedal at the right of the steering column by which the external contracting brake bands on the rear wheel drums are actuated. These brakes are liberal in proportions, the drums being 14 inches in diameter. Much care has been taken to perfect these brakes to obtain the greatest efficiency, as safety is regarded as an absolutely necessary quality, and besides being operated with but little pressure they serve equally well moving forward or backward. These cause no noise whatever as the usual heavy brakerods have been replaced by strong wire cable that is hidden from view inside the frame. Both sets of brakes are fitted with equalizers so that pressure is uniformly exerted upon both wheel drums. In this equipment the Reo the Fifth has received admirable attention.

Speed Changes by Central Lever. The speed changes are made by the manipulation



Left Side of Reo Motor, Showing Liberal Hand Hole Plates and Large Water Connections.

of a lever surmounted with a knob or ball which is mounted in the centre of the top of the transmission case. This lever is installed on a ball and socket so



that its greatest movement at the top in any one direction is three inches. The lower end of the lever is projected into the gearbox so that by moving the



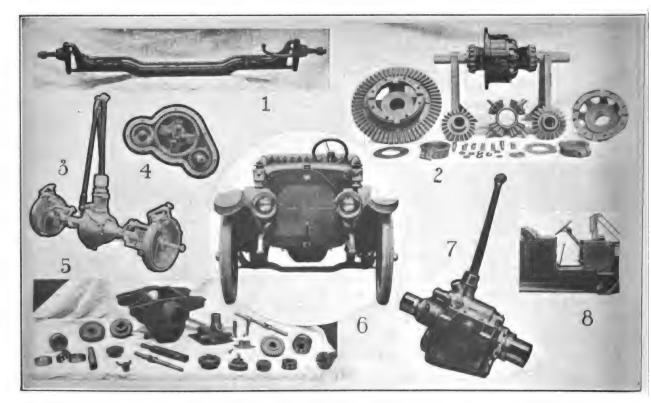
Reo Rear Axie with Cap of Housing Removed, Showing the Differential Assembly, and the Large Brakes—Drive Pinion and Rear End of Shaft Is Seen in Smaller Illustration.

top in any one of the directions that would be possible with the ordinary H slot as adapted for the use of side levers the gears are shifted as they would be with the conventional lever. The lever when upright is in neutral. The rear right position is high speed, the rear left is low, the right forward the intermediate and the left forward the reverse. The movement of the lever is slight and its position such that the driver has no inconvenience in entering or leaving his seat at either side of the car. With this

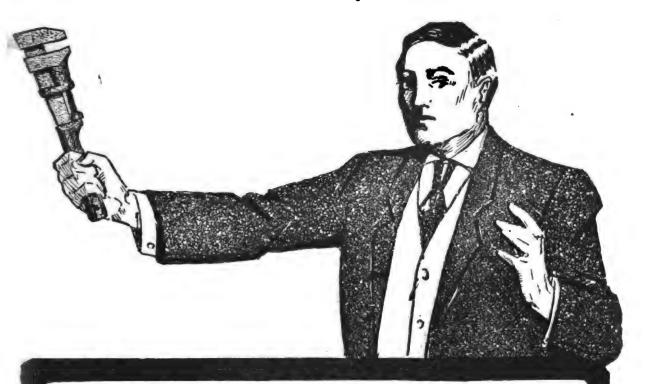
central lever and the manipulation of the brakes of the pedals there is a minimum of effort required for operation, and the driver need never take his hand from the steering wheel save to change his gear rationally and the operations are well within his capacity. He can use both hands to steer and use both brakes should occasion demand. In addition there is a foot accelerator and a muffler cut-out.

The comfort of the use of the car is further enhanced by there being a very effective silencer that is mounted under the body at the right side. The speed of the car is rated at 45 miles an hour, which is extremely conservative. The Reo the Fifth is to be marketed with differing forms of body. The five passenger touring car is the largest standard equipment. The next is the four-passenger touring car. The combination body gives accommodation for four passengers and with the tonneau removed this may be converted into a runabout, with or without a turtle back, or the deck may be clear. The runabout proper has the gasoline tank carried on the rear deck. The gasoline tank capacity, wherever located, is 15 gallons.

The cars are equipped with oil, dash and tail lamps, gas head lamps, generator, horn, and complete tool and tire outfits. All of the lamps are finished in black with nickel trimming. The upholstery is deep and luxurious, the seats and cushions being covered with heavy leather. The first cars delivered were the four-passenger touring model, and following these the two-passenger torpedo roadster will be sent out.



1—Reo Front Axle and Timken Bearings. 2—Reo Differential, Assembled and Disassembled. 3—Reo Rear Axle Construction, Driving Shaft and Torsion Tube. 4—Timing Gears of Reo Motor. 5—Reo Transmission Gearset Disassembled. 6—Reo Roadster as Seen from "Ahead," 7—The Reo Control Lever and Transmission Assembly. 8—Reo Single Control as Seen in the Car.



THE MAN WITH A COES

is not "bowed by the weight of centuries" as was the Man with a Hoe—but he will be bowed with the weight of years before his COES wears out.

When a salesman tries to sell you a wrench of doubtful pedigree tell him you want a COES. Look for the star trade mark and you can't go wrong. If he's loaded up with "near-Coes" counterfeits, he's "in bad" and we're sorry for him.

You'll need a COES sooner or later. Buy a COES now and save what you might have thrown away on imitations.

Five styles-50 sizes, from 4 to 72 inches.

30 per cent. stronger than any other wrench.

Coes Wrench Co., Worcester, Mass.

Agents: J. C. McCarty, 21 Murray St., New York

John H. Graham & Co., 113 Chambers St., New York



Shoolbred & Co., London, England, has being using Lacre trucks, made by the Lacre Motor Car Company, Ltd., Letchworth, England, for the past six years, and now has 56 of these vehicles in service in connection with the delivery of goods from its department store. Leycester Barwell, one of the partners of the concern, states that the motor vehicles have doubled the road mileage and it would have been necessary to have increased the number of horses from 300 to 500 or 600 in order to have produced the same results. He says:

"Before we started motor vans we had 300 horses in our stables, and at present we have 120, mostly for heavy work. Each van does the work of at least six horses on an average, and many rounds would take quite eight horses; that is, supposing it were possible to use animals at all. This cannot be done, however, as vans do not start until fresh supplies are in from Covent Garden Market and the fish market, and the day would not be long enough to deliver fresh fruit, wegetables, fish, etc., in time to be of use.

"By means of these 56 vans we have doubled our road mileage a year, as we have added many new rounds that could not be undertaken with horses. On

the supposition that all our present routes could be covered with horses, we estimate we would require from 500 to 600 horses in our stables. Taking the average of the last six years we have increased our stable expense £400 (\$1948.60) a year, and to offset that we have increased our road mileage no less that 100 per cent.

"In the six years, beside extending all our existing country rounds, we have added 20 new districts be the use of 12 additional vans; four vans to a district daily, and eight do one district three days a week and another the other three days. These 12 van mean 12 drivers at 30s (\$7.30) a week, and 12 porter (helpers) at 26s (\$6.32), or increased wages of £174 (\$8546.40) a year. But as motor vans are much cheaper to run, the total expenses only average £405 (\$1968.36) a year more. Had we put on 12 additional horse vans, each worked by four horses, the expense must have been increased £5000 (\$28,300) a year, including the wages of 12 porters."

Based on actual figures kept by Shoolbred & Co. the 56 vans have averaged \$257.92 for repairs \$228.73 for tires, \$233.59 for fuel, \$34.06 for oil and



Type of Lacre Motor Van Utilised with Splendid Success by Shoolbred & Co., London, Eng., for the Past Six Years.

ease, with a total operation expense of \$1445.34 a ar for the last six years.

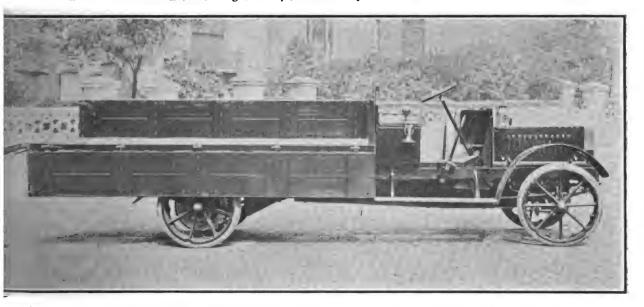
Lacre trucks are made in a large number of degns. An accompanying illustration shows a fleet of ins, similar to that used by Shoolbred & Co., while 10ther presents one of the 30 horsepower two-ton nge sided wagons recently shipped to the Bangkok orporation in Siam. The engines on both of these odels have bore of 4.33 inches and stroke of five. evolutions are limited to a maximum by a heavy type intrifugal governor located in the crankcase. Ignion is by Bosch magneto.

At the recent kilometer races of the Swiss Autonobile Club at Genf, there were 48 starters in the
ine classes. In the touring car division, the winners
were: Paiche and Grignon in Lion-Peugeots, Huber
Chenard-Walker, Paisant in Rochet-Schneider, and
loy and Deydier in Cottin-Desgouettes. The last
lentioned covered the distance in 0:32.2, the best
ime made in this division. In the racing classes, the

there are at present 23 automobile factories in that kingdom, giving employment to more than 5000 workmen. It is estimated that the annual production for 1911 will be about 5000 machines. There are also 50 factories engaged in the production of bodies and about 50 parts concerns.

A business firm in Latin America, engaged in the automobile business has made inquiry of the Department of Commerce and Labor for information concerning motor trucks with self-dumping bodies suitable for hauling road materials. The trucks should have a carrying capacity of two to five tons. The firm also is in the market for a motor truck with platform body, with or without sides, for commercial purposes.

Germany's new West African territory is expected to be connected with its East African colony by a service of motor cars across the continent passing through the Belgian Kongo. A service of this nature already has been tried out with excellent success in



Hinge Sided Two-Ton Truck Shipped by Lacre Motor Car Company to Bangkok Corporation in Siam.

victors were: Derny with Hispano-Suiza in 0:35.2, Granet with Fiat in 0:54.2, and Nigg with Fiat in 0:24.4. The latter establishes a new kilometer record for Switzerland.

Entries for the 1912 Grand Prix race in France closed Dec. 31, although additional entries will be received until March 31, at an increased fee. Among those which will start in the event for large cars are the following: Lorraine, Dietrich, Darracq, Peugeot, Rolla Pillein, Fiat, Mercedes and Benz, while these are considered as possible American representatives: Marmon, Lozier and National. Other possible starters: Clement-Bayard, Mors, Opel, Itala, S. P. A., and Austrian Daimler. In the small car division, the following entries have been received: Delage, Peugeot, Gregoire, Sunbeam, Calthrop, Brookshall, Excelsior, Laurin-Klement, and Sizaire-Naudin.

A recent announcement from Belgium indicates that

the Belgian Kongo, and the German government has decided to adopt the same means of communication. New roads will have to be constructed through forest and hewn out of the mountainous country; bridges will have to be built to span rivers, and a considerable amount of organization will be necessary before the scheme can be put into operation. Already a number of German engineers and military officers are surveying the ground and studying the best route.

Although the United States is experiencing some difficulty in deciding upon a type of motor transport which shall present the proper qualifications for army service, according to the annual report of the War-Department, it would appear that other countries feel reasonably certain American manufacturers can produce something which will be of interest to them in this connection. An American consular agent in one of these foreign countries has reported to the government that a firm of prominent merchants, a gov-



ernment contractor, has requested drawings and specifications of vehicles suitable for various purposes in the United States army. The firm writes there is a possibility of considerable business in these lines with the local War Department, as the models recently accepted are proving too heavy for the uses to which they are to be put.

The Cape Electric Tramways, Ltd., of Cape Town, South Africa, has decided to install a motor omnibus line in that city and vicinity for the purpose of acting as a feeder for the general tramway system.

An American consul in Australasia reports that a business firm in his district is desirous of securing the local agency for some first class American electric automobile with storage batteries for covering long distances.

A contract has been entered into between the minister of public works in Venezuela and two citizens of



Reo Car in Which Californians Recently Reduced Pacific Coast Record.

Valencia, the capital of the State of Carabobo, for an automobile service, carrying passengers and freight, between Valencia and Nirgua.

China seems to have awakened to the need for modern improvements in many ways. In a recent issue of a publication in Shanghai appeared the following: "Though regret would be felt at losing sight of the China pony galloping with the red wagon through dense Shanghai traffic, the fact cannot be ignored that the superior power and effective brakes of the motor impelled fire engine allow of 50 per cent. greater speed with probably 100 per cent. more safety to passers-by, and it is to be hoped that Shanghai will soon possess none but motor propelled fire fighting appliances."

The winter reliability trials of the Royal Automobile Club of Sweden, in which two American cars secured prizes in 1911, will be held over the route between Stockholm and Gothenburg and return, Feb.

4-9. The total distance is 600 miles, and the trials will be divided into two classes, in one of which the Winter cup will be the chief award and in the other, the Gothenburg trophy. Sweden is a country much devoted to winter sports, and the constantly increasing entry lists for these winter motor contests attest to their popularity.

Contrary to the usual practise in Swiss cantons, the canton of St. Gaillen has issued an open letter pointing out the advantages to be gained by the use of motor cars, and mentioning the increase in automobiles in use there since 1904. During that year there were 66 cars and 70 motorcycles, and the number had increased to 213 cars and 121 motorcycles at the end of 1911. The inference seems to be that foreign motorists will be particularly welcome in that district.

Considerable interest is being manifested in the tour de France being organized by L'Auto of Paris. As already has been stated in these columns, the tour

is to start from Paris March 1, 1912, and end in that city, March 20. Fifteen days will be spent on the road, while stops of 24 hours will be made for exhibition purposes at Lyons, Nice, Marseilles, Toulouse and Bordeaux. This feature is expected to make an appeal to manufacturers, who will thus gain an admirable opportunity of demot strating their wares. Among the car already entered are the following Three Fords and a Hupmobile from America; three Barres, three Alcyons three Corre-La Licornes, three Doriot Flandrins, two Gregoires, and one each Delage, Hortu and Crespelle.

The Royal Automobile Club of Great Britain has announced its intention of contributing £500 toward the funds of the International Road Congress, which will be held in London in 1913. The committee also has notified Sir George S. Gibb, chairman of the English road board, that it will be pleased to make

all foreign delegates, who may be visiting the country in connection with the conference, honorary members of the club for the period.

REO SECURES COAST RECORD.

Frank Bryant of San Francisco and Edward Waterman of Fresno, Cal., recently reduced the running time between the two cities, a distance of 205 miles, from 5:41:30 to 5:28:00. Considerable rivalry is manifested over these intercity records on the Pacific Coast, and every few weeks some information is furnished as to new marks created or attempts to reduce the former running time. This San Francisco-Fresno record has been a bone of contention for some months. The latest mark was set in a stock 30 horsepower Reo car, made by the Reo Motor Car Company, Lansing, Mich., and shown in the accompanying illustration.

Motorists should see that their individual states require lights on all vehicles using the highways at night





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Visitors at the winter shows will find the Cartercar exhibit intensely interesting, because it will show them the newest models of this famous motor car. They represent the most advanced ideas in automobile building.

Friction Drive

The Cartercar patented Friction Transmission gives any number of speeds,—is controlled with one lever,—and gives a pulling power sufficient to take the car up a 50% grade.



Model "R" Touring Car \$1600

Self Starter

All new models are equipped with self starter. Also full floating rear axle, three strong brakes, chain-in-oil drive, three quarter elliptic rear springs, and many other good features.

Five Excellent Models at the New York and Chicago Shows

Be sure to see these splendid cars. Roadsters, Coupes, and Touring Cars. A careful study of the Cartercar construction will convince you that it is the simplest, most reliable and most efficient motor car on the market today Ask our representative to explain the famous Friction Drive to you. Write for advance catalog.

Cartercar Company

Pontiac, Michigan

DETROIT BRANCAN



SCOT EIGHT JET CARBURETOR.

A carburetor possessing several unusual features is the Scot, brought out recently by a firm in Glasgow, Scotland. This device has eight jets instead of the usual one or two, and the top of each is within its own choke tube. At Fig. 1 is a sectional drawing of the vaporizer and two of the jets are depicted

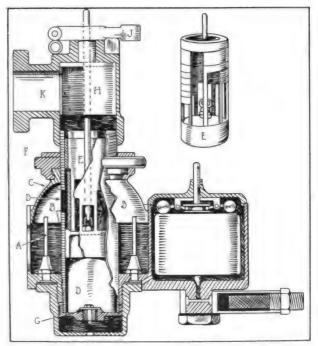


Fig. 1—Carburetor Having Eight Jets, Automatically Operated.

at A, and the complete part, separately, at E.

All of the eight jets are enclosed in a sliding cone shaped member, shown at C, and the mixture passages at B. These continue upward and lead into the mixing chamber through ports in the main tubular body D of the carburetor. Within this body is an automatic piston valve which has eight slots of different lengths. When the motor is inactive this mem-

ber is at the bottom of the tubular casing D, and only one jet is exposed to the suction of the motor.

As soon as the engine is started and the throttle is opened, the additional suction raises the automatic or piston valve, so that more of the slots register with the ports in D, until at full throttle all are in action. By this operation the gas and air are regulated automatically according to the requirements of the motor and in conjunction with the throttle.

The piston valve returns to its normal position by its own weight, no springs being utilized. In order to retard the fall of the valve so that it will not drop too quickly the lower part of the chamber is closed, providing a cushioning effect. The upward movement is free, this being brought about by a non-return air valve G in the capped end of D. When the suction of the motor tends to lift the piston valve, the non-return member is raised from its seat, and air passes into the space below the valve. This arrangement prevents erratic operation due to the irregular suction of the engine.

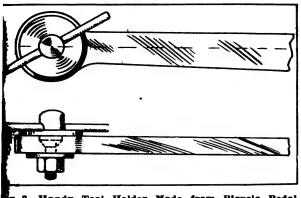
It will be noted that the choke tubes are taper in section, and by means of an adjustment provided in the form of a knurled nut F which engages with a groove in the cone piece, the latter can be raised to any desired point, so that the effect of an adjustable choke tube is obtained for each jet. The knurled member is locked by a nut.

A refined detail in the design of the carburetor is the provision of passages communicating between the jet and float chambers. These are not shown in the drawing, but are formed within the walls of the float chamber cover and those of the jet member. These passages equalize the pressure within the two compartments, so that when that within the jet chamber is lowered below the atmospheric by the suction of the engine, a low pressure also is present in the float chamber, and there is no tendency for an excess of fuel to pass out through the jets.

Another feature is the provision of passages between the jet chamber and that below the piston valve the effect of this being, it is claimed, to prevent the part rising higher than it should. The piston valve is fitted with a central rod which passes out through the top of the throttle chamber and by this wire the operation of the valve may be noted from the outside.

The throttle H is of the vertical rotating sleeve

rpe, the lever being shown at J and the intake pipe t K. The usual float and its chamber are provided and a filter is fitted below the latter. The strainer



. 2—Handy Tool Holder Made from Bicycle Pedal Crank.

s incorporated in the union, which may be rotated to my desired angle by releasing a locking nut.

INEXPENSIVE TOOL HOLDER.

A handy and inexpensive tool holder for use with round tools only may be made from an ordinary bicycle pedal crank, as depicted at Fig. 2. The member is cut off near the large end and through the pedal pin hole is fitted loosely a shackle bolt having a good thread and nut. A thick washer is slipped over the bolt after a groove has been filed across its centre, and the cut must be such that it will seat a piece of .25-inch round cast steel. The bolt is then cut off to a convenient length and a .25-inch hole drilled, enough thread being left to enable the tightening of the tool after it has been passed through the hole in the bolt. The tool is seated in the groove of the washer. Thin washers may be utilized for adjusting to the required height and these are placed under the grooved member.

NEW DESIGN OF SPARK PLUG.

A new form of spark plug specially designed for use in Ford engines, has been brought out by an English concern, and is shown at Fig. 3. The electrode is of peculiar construction as the central member after passing through the insulating material is fork shaped, thus providing two sparking points. The latter are in proximity to a spoon shaped member which is integral with the metal of the plug, and it will be noted that its construction is such that it protects the points of the split member. It is recessed so that any oil may return to the cylinder and not foul the plug. The insulator at its inner extremity is made very thin, so that the heat of combustion makes it almost incandescent, hot enough, in fact, it is claimed, to burn up any lubricant which reaches it before it has time to carbonize. In practise these plugs are said to be entirely successful.

HEATING TOOL STEEL.

There are three distinct stages in heating tool steel: First, for forging; second, for hardening;

third, for tempering. The first requisite for forging is a clean fire and plenty of fuel, so that jets of hot air will not strike the corners of the piece; next the fire should be regular and give a good uniform heat to the whole part to be forged. It should be keen enough to heat the piece as rapidly as may be, and allow it to be heated thoroughly and through, without being so fierce as to overheat the corners.

Steel should not be left in the fire any longer than is necessary to heat it clear through, as "soaking" is very injurious, but, on the other hand, it is necessary that it be hot through, to prevent surface cracks. By observing these precautions a piece of steel may always be heated safely, up to even a bright yellow, when there is much forging to be done on it. The best and most economical welding flux is clean, crude borax, which should be first thoroughly melted and then ground to a fine powder. After the steel is heated properly, it should be forged to shape as quickly as possible, and just as the red heat is leaving the parts intended for cutting edges, these members should be refined by rapid, light blows, continued until the red disappears.

For the second stage of heating, that for hardening, great care should be exercised; first, to protect the cutting edges and working parts from heating more rapidly than the body of the piece, and second, to see that the whole part to be hardened is heated uniformly through, without any portion becoming visibly hotter than the rest. A uniform heat, as low as will give the required hardness, is best.

For every variation of heat which is great enough to be seen there will result a variation in grain, which may be noted by breaking the piece, and for every such difference in temperature there is a very good chance for a crack to appear. Many a costly tool is ruined by inattention to this point. The effect of too high heat is to open the grain; to make the steel coarse, a condition that should be avoided.

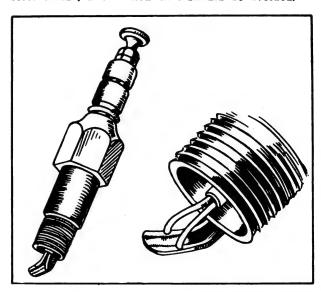


Fig. 3—Spark Plug Designed to Obviate Short Circuits by Oil.

As soon as the piece is heated properly for hardening, it should be quenched promptly and thoroughly in plenty of the cooling medium—water, brine or oil,



as the case may be. An abundance of the cooling bath, to do the work quickly and uniformly all over, is very necessary for good and safe results, and in hardening a large piece safely a running stream should be used. Much uneven hardening is due to the use of too small a bath.

For the third stage, tempering, the first requisite is again uniformity. The next is time. The more slowly a piece is brought down to its temper, the better and safer the operation. When expensive tools are to be made it is a wise precaution to try small pieces of the metal at different temperatures, so as to find out how low a heat will give the necessary hardness.

REMEDY FOR BURNS.

In working around a warm motor or at the forge, the repairman occasionally becomes careless and a burn results. Sometimes the skin blisters and breaks and is difficult to heal because of foreign elements which find their way into the abrasion. A valuable and simple remedy and one that will prevent the blisters is picric acid. The burnt spot is moistened with water, and a little of the powder spread on. In about half a minute the salt will have so far penetrated that the burnt member can be cooled in water without in any way weakening the effect of the remedy. Even if the inner skin has been burnt away, it is possible, after a few hours, to use the damaged member without discomfort. Picric acid is a dangerous explosive, so it is well not to keep it in large quantities. A small amount in a bottle may be stored in some convenient place.

SHRINKAGE OF CASTINGS.

The allowance necessary for shrinkage of castings varies for the different kinds of metals, and the conditions under which they were cast. For castings where the thickness runs about one inch, cast under ordinary conditions, the following allowances can be made a foot: Cast iron, .125 inch; brass, .1875; steel, .25; malleable iron, .125; aluminum, .1875. Thicker castings, under the same conditions, will shrink less, and thinner ones more, than this standard. The quality of the material, and the manner of molding and cooling will also make a difference.

MAKING DRY CELLS.

According to Modern Electrics a serviceable dry cell battery may be made as follows: Take a zinc and copper plate of equal size and on one of the members pour a quantity of melted hyposulphite of soda. Place the other plate on top and allow to cool. After the temperature has become normal, attach binding posts. This device will furnish a fairly large current which will be dependable on the size of the plates and the thickness of the soda between them. Such members are inexpensive and made easily.

PLATINA BRONZE.

Platina bronze is the name given by Helouis to an alloy he makes for household utensils. It is composed of 100 parts pure nickel, 10 parts tin, and one part platinum, by adding to the melted nickel platinum and four parts of tin and then gradual introducing the remaining six parts of tin. For beletc., 100 parts nickel, 20 parts tin, two parts silvand one part platinum should be used.

AGING BRASS FITTINGS.

Lamps and brass fittings of the motor car may given an aged appearance by fumigating with spit of salt, nitric acid, or ammonia; or treated with sphate of copper and chloride of antimony, nitrate iron, or sulphuret of potassium (potash). This we result in a green-blue, brown and almost black, deep olive green. The shades may be varied by mothan one application, this depending upon the alle

BRASS LACQUER.

A subscriber suggests the following formula for a brass lacquer: Dissolve in water as much alum a it will hold in solution, and add an equal amount of hydrochloric acid. Immerse the brass in this mixture for about 10 minutes, then place in cold water.

REDUCING GRAIN OF STEEL.

Steel which is coarse grained on account of leaving the rolls at too high a temperature may be made fing grained and have its ductility increased greatly with out lowering its tensile strength by reheating to cherry red and cooling at once in air.

FITZGERALD DINES WITH MOTORISTS.

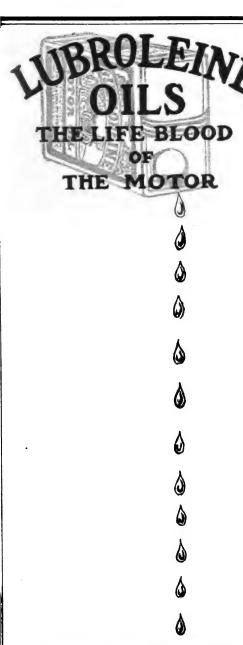
Mayor Fitzgerald of Boston, who is said to haw convinced Gov. Foss of Massachusetts that the motor ists of that state should pay twice the fees they do a present, so that Boston should be able to secure some of the state funds for road purposes, was one of the guests of honor at the annual banquet of the Bay State Automobile Association in that city last month. The mayor explained his plan and urged the motorist to accompany him to the state house in an effort to pass the proposed bill.

Among the other guests were: George W. Cole man, president of the Associated Advertising Club of America; Charles J. Glidden; A. G. Batchelder chairman of the executive committee, American Auto mobile Association; George S. Smith, president, Boston Chamber of Commerce; W. D. Sohier, Massachusetts Highway Commission; Harold Parker, formerly chairman of that commission; J. H. McAlman, president, Boston Automobile Dealers' Association.

TOUR DEPICTED BY FILMS.

The moving pictures of the Ocean-to-Ocean tour of the 12 Premier cars, made by the Premier Motor Manufacturing Company, Indianapolis, Ind., were displayed in that city recently and attracted considerable attention among automobilists. The films proved unusually interesting, depicting as they did the scene and incidents of the tour from one ocean to the other. These pictures will be exhibited in all the principal cities of the country and should stimulate interest in the good roads movement.





A Profit Talk to Dealers

Would you like to build up a profitable trade on Motor Oils? We do not mean an occasional sale but a steady demand by an increasing number of large and small users who will buy all of their oils from you, year in and year out. There is money in it and we can tell you how to do it. All you have to do is to handle Lubroleine Motor Oils and Greases and sell them our way.

If you have a family physician who has cured you of every illness to which you have been subjected, it is reasonable to suppose that you are going to stick to him and recommend him to your friends. The same thing is true of the owner of a motor. If you can cure his motor troubles (and the largest percentage of trouble in motors arises from imperfect lubrication) and start it to running sweet and true again and tell him how to avoid future trouble, you are the man who is going to get all of his trade on oils. There is no one oil that is suitable to use on all motors under all conditions. A motor just out of the factory requires a different oil from one which has been in use for a number of years. A high powered racing motor cannot use an oil which would be suitable for a light roadster. In order to get perfect lubrication all the time the requirement of each individual motor should be known and the best oil used for each particular engine.

These facts are borne in mind in making Lubroleine Oils and Greases. These products are the result of scientific study, experiments, chemical and physical tests, and forty years' experience in making lubricating oils exclusively. We do not claim that any one of our oils is suitable for all motors under all conditions, but we do positively affirm that every one of our oils is the best for the purpose for which it is designed. Lubroleine Oils and Greases are made from Pennsylvania Crude Oil, which is recognized as being the finest lubricating raw material in the world; it is thoroughly filtered to remove all impurities and to preserve its power-producing properties, and is manufactured under formulas which have stood the test of forty years' competition.

Now, Mr. Dealer, you can sell Lubroleine Oils and Greases with the absolute assurance that they are the finest and most lasting oils in the world and that they will give perfect satisfaction if the right oil is used for the right motor. All you have to do is to find out the horse-power, condition and age of the motor, we tell you the oil best adapted to it. Lubroleine Oils and Greases and a live dealer make an invincible combination for securing and holding the motor oil business of any given locality. Write Dept. N. for prices, terms and literature.

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BATTERY TRUCK CRANE.

Where a fleet of commercial motor vehicles is maintained for the transportation of heavy packages to storehouses, shipping points and other places, expedition in loading and unloading becomes imperative. Various methods of accomplishing this result are now employed, and among these may be mentioned the battery truck crane, which presents at least three notable advantages, in that it is always set up ready for instant use, can move quickly from place to place, and carries its power plant as a permanent part of its equipment.

An accompanying illustration presents the device recently brought out by the General Electric Company, Schenectady, N. Y. It is an electric vehicle which has a crane arranged to swing in an arc of 180 degrees mounted on the forward end. The hook is raised and lowered by a one-ton hoist, located immediately behind the crane, and the motors driving this and the vehicle are operated from a storage battery, so situated at the rear end as to act as a counter-

weight. Special attachments are fitted to suit the character of the work contemplated, these consisting of rope and chain slings, barrel tongs, bale grapples box hooks, snatch blocks, small tools, etc.

The electric hoist comprises a compact weather proof motor, a controller, gears, and a drum combined as a unit, capable of lifting one ton 20 feet a minute. The hoist controller handle is connected to a lever convenient to the operator, who pulls to raise, pushed to lower, and lets go to stop the load at any point, the lever going to the "off" position in the latter instance and holding brakes automatically locking the drum. A load brake also is provided to prevent excessive speeds when lowering.

Where the material to be loaded is in parcels of one ton or less, and is in a pile where the truck can be brought alongside, the battery crane is placed in an advantageous position, the brakes set, and the vehicle remains stationary, as the boom moves back and forth between the picking up and depositing points. Some idea of the rapidity with which this device works may be gained from the following:



General Electric Company's Battery Truck Crane Loading Trucks with Material Collected from Various Points,

Three hundred castings aggregating 65,000 pounds are unloaded from a gondola car in five hours, gives an average of 1.2 lifts a minute. A box car was aded with 64 800-pound barrels of plumbago in 25 inutes and four cars in 2.5 hours. This averages arly two barrels a minute, hoisted nearly five feet d swung well inside the car. By the pick-up-and-method, in which the material was carried on the bok, 60 800-pound barrels of plumbago were moved to feet in one hour, one helper only being required.

One hundred and fifty 300-pound boxes of rubber pre conveyed 75 feet and loaded into a box car in minutes, three boxes being slung together and a find trip made every minute.

QUICK DUMPING BODY.

A self-dumping body which has a number of good atures is that produced by the Monahan Vehicle ompany, Providence, R. I., and shown in an accom-

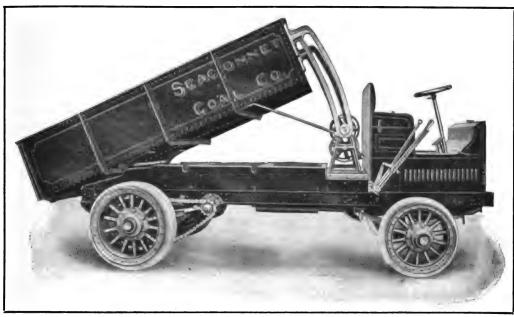
illustraon as fitted to a ne-ton Alco truck s constructed by lis concern these odies are made rith . capacities anging from one 10 tons. The laterial is No. 10 teel plate, there enerally being hree and someimes four plates orming the sides nd bottom and nother for the orward end, while he rear gate is a eparate construcion that is susended from the op and sides.

The angle of levation is 42 derees, considered ufficient for move-

nent of all loads.

ence to the wheels and springs. Forward of the body proper the bolster is recessed to six inches in height, this surface being heavily decked with oak for the installation of the hoisting mechanism, which is bolted to the frame.

When the body is elevated it is supported by the hoisting gear forward and two heavy hinges, one at either side of the chassis. These hinges are riveted to the bottom of the body and its frame, and bolted to the bolster, the bolts passing through the bolster and chassis frame. Three steel members, the transverse shape and size of the body, are formed of T plates, these being with wings two inches wide and .3125-inch whick. Two other steel members are made in angle form with wings two inches wide and the same thickness. The two steel angles form the end frames of the body and the three T plates the centre members, to which the body plates are riveted. The tops of the side and end plates are reinforced by a steel angle of the same proportions securely riveted. Across



Monahan Dumping Body Fitted to Alco Truck, Elevated to Maximum Height for Unloading,

acept under unusual conditions. In order to provide his it is necessary to locate the fulcrum of the unading apparatus practically above the rear axle, and hat the rear end may be lowered that end of the hassis frame is cut off, shortening the side members and restoring the end member by reinforcements and tays.

As it is necessary to have the centre of gravity s low as possible the construction of practically all ower wagons, with reference to the wheels, is such hat the body must have a width of about 66 inches a front and 78 at the rear, with side plates of a length and height sufficient to give the required capacity. The rear end of the body must extend beyond that of he chassis from one to two feet, an average of 18 aches.

A wooden or bolster frame, in large bodies 12 aches in height, is attached to the chassis frame to rovide sufficient clearance for the body with refer-

the rear end at the top is fitted a steel rod or bar which stiffens the construction and on which the end gate swings. This gate is a steel plate reinforced as is the body, and when lowered it is held by a transverse bar constructed with two small lips which bear against its lower edge. This bar is operated from the side by a hand lever.

The hoisting mechanism consists of two racks attached to the forward end of the body, at the end of the transverse body plate, the lower end of these extending to about the height of the front axle. The ends are stayed by rods having angles of about 45 degrees riveted to the bottom of the body, close to the side and to the body frame. While the body rests on the bolster normally, it is possible to raise it easily by the crank which operates a succession of gears and pinions meshing into the racks. Thirty-one revolutions of the hand crank raises or lowers the carrying receptacle. The entire mechanism is patented by the Monahan Vehicle Company.

PURCHASE OWOSSO PLANT.

Eddy Bros., a millionaire lumber firm in Bay City, Mich., is said to have closed a deal for the purchase of the mechanical parts and patent rights of the Owosso Motor Company, Owosso, Mich., maker of commercial vehicles. It is understood that the Bay City people contemplate the removal of the plant to that city, where ample capital will be forthcoming for a largely increased production during 1912.

SOLVING LUMBER PROBLEM.

Those who are familiar with the handling of lumber are well aware that this line offers abundant opportunity for those who desire to study methods of loading and unloading. Starting with the proposition that the motor vehicle is most productive of economy

The rollers are seven in number, and two of the are connected by gears with winch handles, by mea of which the load is carried forward or backward. desired. The two winch rollers are at the front at rear, with the gearing so compounded that a load m be moved with comparative ease.

With the utilization of this vehicle it was nece sary to adopt methods somewhat at variance with cu tom, and it was decided that the loading should be a complished so far as possible without the truck. two-wheeled carrier with a long plank reach w brought into service for this purpose. Such had be employed for moving material about the yard, and I piling or packing the lumber with one end on the ax and the other on a wooden horse, it was possible make up loads at any convenient time.

The lumber is packed on this carrier at a heig so that the truck may be backed partially under:

Then the load is los ered by removing ti horse, and when t weight has settled the geared roller workman simply turi the crank and draws on the platform as t as necessary. The reroller does most of the work in both loadii and unloading, the fo ward member mere acting to make the lot snug and secure, at to start it backward the truck. When ti scene of delivery reached the winch back the lumber off th platform, the rear et retained by the cha dropping to the groun The vehicle is the started and the load deposited exactly whe

plifies the problem m terially and the She





Sampson Truck Just Loaded and Piled Load Ready for Vehicle on Its Return to Shevlin-Carpenter's Lumber Yard.

when it is on the road, it follows that some means must be devised for reducing the time spent in the yard or at the point of delivery. Numerous attempts have been made to solve this problem with varying degrees of success.

The Shevlin-Carpenter Lumber Company, Minneapolis, Minn., has in its service a Sampson four-ton truck, made by the Alden Sampson Manufacturing Company, Detroit, and experiment with it has developed methods for loading and unloading which reduce the work to a decided degree and have given satisfaction. The truck as delivered to the company was with a longer wheelbase than standard, and the deck of the platform contained a series of rollers extending from one side to the other. These support the weight of. the load and on them the lumber is pushed forward or pulled backward with minimized effort.

PIERCE-ARROW ON THE FARM.

Alfred G. Lewis and Mrs. George H. Lewis, whos estates, the White Springs Farm and Bellwood Farn adjoin each other near Geneva, N. Y., have been uti izing a Pierce-Arrow five-ton truck made by the Pierce Arrow Motor Car Company, Buffalo, N. Y., with splei did success. The former property comprises 70 acres and the latter 350, much of which is under cu tivation, though sheep and cattle are raised and dair products form a large share of the total.

In the early part of the summer of 1911 it wa found necessary to utilize all the available horses o the two farms for the purpose of hauling pea vine

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Easily placed in any position and will stay where put. SPECIFICATIONS:

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WIDTH	HEIGHT	TOP	LOWER	BRASS
41 "	27 ½ 🖷	12	14 "	\$50.00
41"	31 W	14"	16 "	50.00
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Special Finish: White or Black Nickel and Gun Metal, \$5.00 extra.

We also carry in stock a complete line of Standard Friction Wind Shields, from \$22.50 each to \$40.00 each. Send for descriptive circular.

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177-179 Portland Street, Boston, Mass. from an 80-acre tract to the place where the peas were shelled for delivery to a canning factory in Geneva. The lack of animals impelled Mr. Lewis to adapt



Unloading Shevlin-Carpenter Lumber Company's Vehicle
by Roller Equipment,

his 66 horsepower Pierce-Arrow touring car for temporary work. During the 15 days that this machine was used for this purpose it was discovered that the cost of transportation was materially reduced over that by horse drawn equipment, and the purchase of the truck followed as a logical sequence.

The truck was delivered to the farms Sept. 1, and in the three months ending Dec. 1 it hauled 1,316,620 pounds of freight with a mileage of 1538. The fuel consumption was 376 gallons, the cost of which was \$45.12. Inasmuch as the vehicle was worked on both farms and it was absolutely necessary to keep an accurate account of its expenses in order to apportion the cost between the two, these figures were found to be as follows:

225.0 45.1
6.0
40.0
24.0
48.0

In considering the work accomplished by the truck it is held that it has been the equal of at least three teams of two horses each for whatever purpose to which it has been put. On the road between the farms and Geneva it has done the work of five two-horse teams.

NEW HEWITT MOTOR COMPANY.

E. R. Hewitt, M. F. Burns, E. C. Converse, William E. Corey and Ambrose Monel have filed incorporation papers for the Hewitt Motor Company of New York City, which will take over the business of the original Hewitt Motor Company from the Metzger Motor Car Company, Detroit. It will be remembered that about two years ago the Metzger company purchased the old Hewitt concern, continuing the production of Hewitt trucks in New York City, under the

direction of E. R. Hewitt, who was retained as man ger of the commercial vehicle department. The naconcern is capitalized for \$1,000,000 and will ope its own factory and service station at West End an nue and 64th street during the present month.

BIRMINGHAM WANTS GARBAGE WAGON.

It will be remembered that the city of Birmin ham, Ala., has been replacing its horse drawn fighting apparatus with automobile equipment, and satisfactory has been the result that Street Commissioner Weatherly is investigating the possibilities to using motor trucks in his department. It is undestood that the city is about ready to purchase five six trucks, one of which must be of sufficient size an efficiency to handle the garbage problem.

UNIVERSAL STOCK SOLD.

Announcement is made from Detroit that Howar Walton of New York City has purchased a controlling interest in the Universal Motor Truck Company of the city, and it is expected that a new company will porganized for the purpose of increasing the production of Universal vehicles. Vincent Link is to remain a chief engineer and designer.

TIRE RESILIENCY BY VIBRATION.

The subject of tires is filled with interest for the business man who is considering the purchase of metor transports. Solids and pneumatics each have the special arguments, and it becomes a question of which will give the desired result at the lowest cost. The are some loads which are so extremely delicate the



Pierce-Arrow Starting from Farm for Geneva, N. Y., will Load of Produce.

the problem of cost gives way in a measure to that resiliency, but even in that instance it is possible gain information of value which may aid in

ng the question of expense. Speli reference may be had to transting eggs, and it is well known it passenger carrying is a form of blic service which should give the eximum of easy riding consistent the economical operation. Other is will suggest themselves.

As resiliency is shown by vibraon, the latter being capable of easurement, a diagram showing is for pneumatic and solid tires il present the relative resiliency d riding qualities of the two forms. he accompanying chart was made the Michelin Tire Company, Millwn, N. J., and in this A shows the dative curves of the two forms hen passing over an obstacle .6125 ch in height and of a short halfand shape, the air filled type beg given above the solid. easurements of the two diagrams now that the pneumatic raised the heel by .156 inch, while the solid fted it just twice as much, or .3125 ich. The former absorbed 80 per ent. of the shock and the latter less

At B the same condition is shown for a long, halfral obstacle of similar height. The pneumatic lifted \$125 inch and the solid 1.03125 inches, the former isorbing 66 per cent. of the shock and the latter inteasing it. C and D depict two similar instances with hobstacle 1.1875 inches in height, and respectively short half-oval and a long half-oval. In C the air lied type raised .375 inch and the other 1.156, the limer absorbing 66 per cent. and the latter none. In the last instance, the wheel was lifted but .4375 with the pneumatic and 1.96875 inches by the blid, the former absorbing 66 per cent. and the latter increasing it.

KNOX OMNIBUSES SATISFACTORY.

Considerable interest has been manifested in mocomplete on America within the past few months. The latest manufacturers to announce the pro-



Five-Ton Pierce-Arrow Loaded with Cabbages Ready for Shipment.

duction of cars of this type is the Knox Automobile Company, Springfield, Mass. Recently 'buses of this make were installed in the exclusive residential districts of Watertown, N. Y.

The driver is conductor and motorman in one. He occupies a separate vestibule, in the door of which is a fare box and change window. The operation of the main door is controlled by means of a lever reaching to the driver's seat. It will be seen that the system is that of the pay-as-you-enter type.

The vehicles are heated by leading the water from the motor through pipes under the seats instead of through the radiator, and the temperature inside may be regulated by the driver. Push bottons notify when a passenger wishes to alight. A complete electric lighting system is installed, which may be controlled by the driver without leaving his seat.

Uniform motoring laws would end the needless confusion attendant upon interstate touring. Now is the time to advocate their passage.

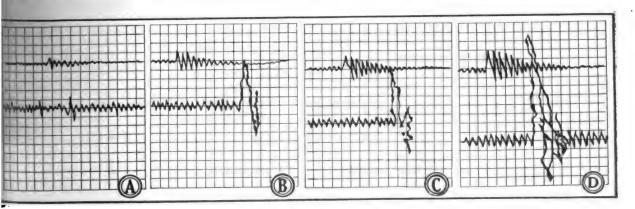


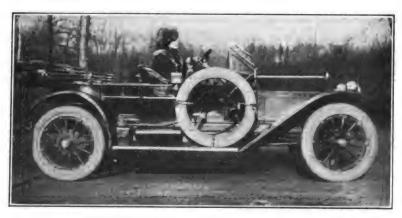
Chart Illustrating Comparative Vibrations of Pneumatic and Solid Tires in Overcoming Road Obstacles,

EVERITT ONE-TON TRUCK.

Although the Metzger Motor Car Company, Detroit, has sold a large share of its truck business to the newly organized Hewitt Motor Company, New York City, the one-ton model has been retained and will be manufactured by the Detroit concern under the name of Everitt. President W. E. Metzger explains that his company finds it is possible to continue the production of this vehicle without interfering in any way with the pleasure car line. Manufacturing operations on these one-ton machines already have commenced and their distribution will be effected through a list of over 400 dealers now handling Everitt pleasure car models.

DRIVES HUDSON WITHOUT GASOLINE.

Paul Legget of Nyack, N. Y., recently discovered that it was possible to operate his 1912 Hudson car, made by the Hudson Motor Car Company, Detroit, even after his supply of gasoline had become exhausted. As is well known the 1912 Hudson machines are equipped with acetylene self-starters. Mr. Legget was



Miss Edith Mendel of Mt. Vernon, N. Y., in Cole Car with Which She Won Recent Hill Climb Event,

driving from Nyack to Chatham, N. Y., a distance of 126 miles, and when between Kingston and Catskill, on the west bank of the Hudson, he ran out of gasoline several miles from the nearest place where it could be obtained. He started the machine with the self-starter and left the gas from the acetylene tank on the dash turned on about one-third, running up and down hill and using only acetylene until he was able to secure a new supply of gasoline.

AMERICAN AGENT FOR MINERVA CAR.

Fred W. Sewall of New York City has been appointed American agent for the Minerva car, made in Belgium, and headquarters will be established at 1964 Broadway. The machine is fitted with a Knight motor, and although new in this country is said to have an enviable reputation abroad.

NEW LAW IN MAINE.

The new motor vehicle law in Maine went into effect Jan. 1. Under the terms of the old statute,

automobiles were registered permanently, but all registrations became null and void at midnight 1 31. The new law provides an annual fee of \$5 cars of 20 horsepower and less, \$10 between 20 35 horsepower, \$15 for those over 35, \$10 for the used for commercial purposes and \$3 for motorcyc. The fee for a driver's license is now \$2. Non-redents may operate their cars for a period of 30 d without registration.

FRASCHINI ON AMERICAN VISIT.

Otto Fraschini, head of the Isotta Fraschini Cx pany, Milan, Italy, maker of the Isotta car, arrived this country Dec. 27, and will devote his time to inspection of several American automobile factor He also will visit the shows in New York City dur the present month.

WOMAN WINS IN COLE.

Women are becoming more and more enthusian in the matter of entering automobile contests, puticularly hill climbing events. This is explained

some women drivers on the ground t they are anxious to show that they guide a machine up hill as quickly a deftly as a man.

At a recent hill climb near Mt. V non, N. Y., Miss Edith Mendell v over a Buick, S. P. O., Chalmers a two Cadillacs, her machine being a Comade by the Cole Motor Car Compa. Indianapolis, Ind. Her time was 0:2: against 0:25.6 for the S. P. O., a 1 Stearns driving. An accompanying lustration shows Miss Mendel at 1 wheel of her Cole.

Miss Edith Vickery and Mrs. J. Winn of Evansville, Ind., are two of thusiastic hill climbing entrants. So another Cole driver is Mrs. C. C. Git of Indianapolis, Ind., who is anxious enter and operate her machine in a cole

test of this nature.

STUDEBAKERS SECURE AXLE PLANT.

Having fulfilled the last condition laid down the chamber of commerce in Port Huron, Mich., t Studebaker Corporation has come into actual possision of the 11 lots and manufacturing plant in the city, in which since 1908 rear axles for E-M-F at Flanders cars have been made, according to inform tion from Detroit. The property originally was donated to the old Northern Motor Car Company, at when the E-M-F Company secured control of that concern it reverted to the chamber of commerce, which stipulated that the deed should not be passed unthe plant had been occupied for five years and the payroll had reached \$200,000.

Two trucks have been built by the New Brita Machine Company, New Britain, Conn., to specific tions that closely follow those of a well known Enlish machine. The trucks were to a special order.

NEW PRICE LIST IN EFFECT OCTOBER 1, 1911, Cancelling all former price lists

The 8-DAY HIGH GRADE BOSTON AUTO CLOCKS

These superbly built 8-day, high-grade clocks have seven-jeweled escapements, Breguet hairsprings, cut steel pinions, compensation balances, dust and water proof cases, etc., and are dealt in and used by those demanding a first-class article.

QUALITY and PRICE — UNAPPROACHABLE
Ask Your Dealer for the "BOSTON" AUTO CLOCK
MODEL B
MODEL C





Adjustable to various angles by Ratchet and Nut at back. In general appearance it closely matches many makes of speedometers.

MODEL D



MODEL E



PRICE LIST-		S A, B, C. MODEL D	MODEL E
PER CLOCK	3 1-2-inch 2	8.00 \$21.00 0.00 24.00 2.00 27.06	\$24.00 27.00 30.00

For (Patent Applied for) Outside Stem Winding and Stem Setting Device, ADD \$3.00 to above prices.

Superior to other devices.—A great convenience for winding clock and setting the hands without opening the clock case.

All sizes stated are the approximate diameters of the dials

The 8-Day | High Grade |

"BOSTON" AUTO For AUTOMOBILES and MOTOR BOATS

On Sale By Leading Jobbers and Dealers.

If Not With Your Dealer Sent on Receipt of Price.

BOSTON CLOCK CO., 16 State St., Boston, Mass.

ELEMENTS OF MOTORCYCLE CONSTRUCTION.

Part XIV—Spring Forks, Frames and Other Devices Utilized to Absorb Road Shocks and to Eliminate Vibrations—How These Are Fitted and the Principle Upon Which They Operate.

(By C. P. Shattuck.)

CONSIDERABLE progress has been made in the development of mechanical devices utilized to absorb road shocks and to eliminate vibration since the introduction of the motorcycle. Over a quarter of a century ago, when the safety bicycle was in use, makers fitted spring forks because solid tires were employed. Many identified with the motorcycle industry will recall their first century run on these mounts and the aching muscles that followed, which were, in the main, due to road shocks and heavy machines.

Of the motorcycle it may be said that there is diversity of opinion as to the location of the short absorbing members, although in the main the said ard form is that of fitting the front forks with some type of anti-vibrating device and even these vary, the designers displaying considerable ingenuity in their arrangement. Others employ springs in the varies parts of the rear construction and some embody the both in the front and rear forks. Irrespective of the design the aim of the maker is to eliminate all vibrations.

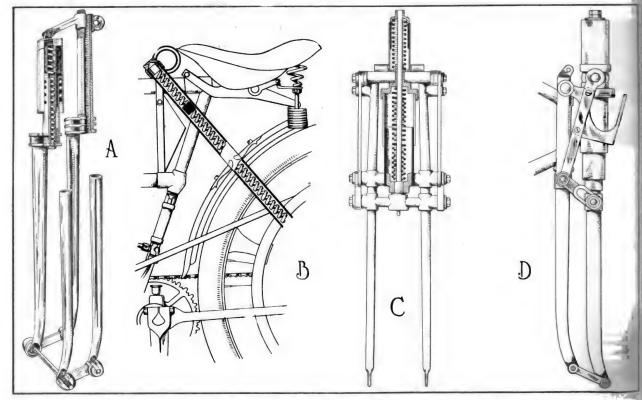


Fig. 80—Spring Fork Designs Fitted to Well Known Mounts: A, Spring and Pneumatic Type Utilized on Pierce, B, Spring Frame of Merkel; C, Sectional View of F. N.; D, Method of Attachment.

Conditions were improved with the advent of the pneumatic tire, but while this resilient member sufficed with the bicycle, the speed of which depended upon the exertions of the rider, the arrival of the motor propelled mount necessitated new designing of frames and anti-vibration devices. Such spring forks as fitted the old Victor bicycle, for instance, hardly were adaptable to the swifter machine, although the principle of present day construction is similar, but refined to a high degree.

tion and road shocks so that in traversing rough surfaces comfortable riding is assured, and in addition the life of the mount is augmented and cost of maintenance correspondingly reduced. In fact, it may be stated that the manufacturer has made wonderful strides in the refinement of these details which contribute to the comfort of the operator and permit of long journeys without tiresome effects.

Spring Forks.

The different conventional types of spring forks



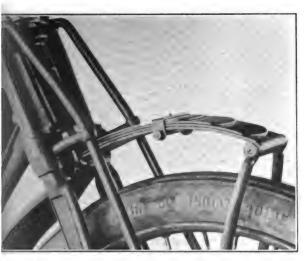


Fig. 81-Leaf Spring Employed on the Pope Mount.

llustrated herein, represent those fitted to several rell known mounts and it will be noted that the loation of the springs utilized and arrangement differs. hose presented at Figs. 80 and 81 emphasize this lissimilarity inasmuch as in the latter design the body of the fork is of rigid truss construction while others nelude an auxiliary member connected at the lower and by short bellcranks. In these the springs are ontained within the tubes comprising the supporting parts.

The cradle design is depicted at Fig. 82. The body of the fork is rigid, and to the heavy crown is atached one end of a long, four-leaved flat spring. The other end of this extends through another fork-like levice and is curled backward and attached thereto. Both forks are pivotally connected by short belicrank evers. The axle of the front wheel is carried at the centre of the cranks, and swings a little below and to the rear of the fork ends. When the wheel encounters an obstacle, it is forced backward and upward, and the resultant shock is absorbed by the

pring.

A similar device is that outlined at Fig. 81. Here he four-leaved spring has but a slight curve and one end is attached to the crown. Double stem han-



Fig. 82—Cradle Spring of the Indian and Compound Forks of Harley-Davidson,

dlebars are fitted to this mount, an arrangement making for strength and safety.

At Fig. 80 are illustrated two types of the spring enclosed members, that at A being employed by a leading maker on both its single and four-cylinder machines. This design incorporates both the spring and pneumatic features for obtaining the cushioning effect. This type is known as the cartridge spring fork, deriving its name from its construction and its operation is that of a piston and cylinder. This arrangement provides both for the upward movement and recoil, these actions being equalized by the pneumatic device. The forks are connected at the upper end by a heavy drop forging, pivotally mounted, and at the lower extremity by shackles, the latter being adjustable and fitted with ball bearings.

A compound fork is also utilized on the member depicted at D, which is employed on another four-cylinder machine. The front fork supports the wheel, while the back fork, which is employed for steering, is connected to the machine in the usual manner. Both are connected by right angle plates and two similar members connect the fork heads. This allows the

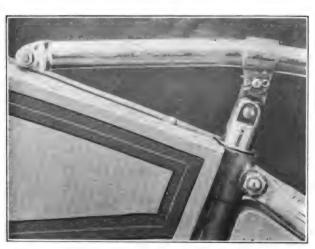


Fig. 83-"Ful-Floteing" Seat of the Harley-Davidson.

front fork to move in a vertical direction and the action is limited by two springs which are fitted into cups, as will be noted at C. One of these cups is secured to the head of the front fork and the upper one slides on the vertical fork stem. A nut is attached, its function being that of a stop for the upper spring which takes up the recoil movement.

At Fig. 82 is shown a cushion fork with which springs are employed and of the plunger type. Various forms of spring forks are utilized and to enumerate them would be to catalogue the different mounts.

Spring Frames.

Some makers fit devices in the rear forks and frame believing that other than spring saddles are essential for comfortable riding qualities. A design of this type is depicted at Fig. 80 B. Instead of the customary method of rigid attachment of the rear forks and stays, a hinged joint is employed at the pedal crank axle. This is a high grade bronze bushing, the ends of which protrude through the lug so that the rear fork crown is hinged on both ends of the bushing. In the centre of the latter is fitted the pedal crankshaft.

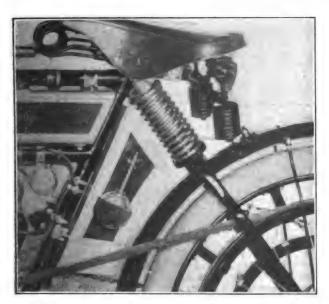


Fig. 84—Coll Member Utilised by N. S. U. to Minimise Jarring at the Seat Post,

Two long spiral springs are enclosed in the rear stays. This arrangement permits the rear wheel to be raised several inches when it encounters obstacles, or in traversing rough roads, without affecting the tension or operation of the pedal chain or driving belt.

A device which is distinct in its construction, and one that is said to eliminate road shocks fully is shown at Fig. 83. This is known as the "Ful-Floteing" seat and among the advantages emphasized are that the frame is rigid and that a lower riding position is obtained by the design. The saddle is attached to a hinged member, this being similarly fitted to the top frame and the saddle post moves freely up or down within the rear stay member. Provision is made for retarding the recoil and it is claimed that the roughest roads may be traversed with ease and comfort.

Jarring at the seat post is minimized in the mount depicted at Fig. 84 by a large coil spring fitted between the rear fork stays and top of frame. The spring is attached at either end and is actuated when the rear wheel strikes an obstruction which lifts the member compressing the spring. Provision is made for this movement by fitting a hinge which is not shown in the sketch, but its arrangement is similar to that depicted at Fig. 80.

A mount which utilizes both a spring fork and a cushion device for the seat, is illustrated at Fig. 85. Here compound forks are used, the rear members being utilized for steering, while the front are employed as the anti-vibration members, and are connected at the lower extremities by curve shaped bellcranks. The upper end is attached to the lamp bracket which in turn is connected with the head of the frame. Vertical springs are employed.

A similar device is fitted to the saddle attached to a hinged arm, one end of which is fastened to the frame while the other carries a plunger red which actuates a spring in a casing. Another spring is fitted therein and these members by compression produce the desired cushioning effect.

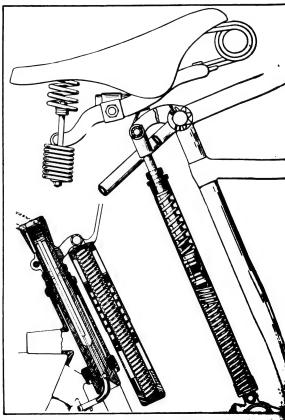
In connection with the motorcycle mention she be made of the stand which is utilized for variance purposes. This member is hinged and when not use occupies a horizontal position. By it the may mount his machine, start the motorcand its operation. It also serves to maintain the embrium of the motorcycle when the latter is not be operated.

ALCO ENDS NON-STOP SERVICE.

After one week of night and day service for a Adams Express Company, Philadelphia, the altruck, made by the American Locomotive Company. New York City and Providence, R. I., ended what believed to be the longest non-stop test in acts service ever attempted by a motor truck. It we found that the machine maintained an average of a hour to a gallon of gasoline and six hours to a que of oil.

DECIDE UPON CARTERCAR.

Recently the Merrill Stevens Company, Jackso ville, Fla., decided to secure the agency for an update automobile which should prove an honor to business name in Florida. In the end the Cartero made by the Cartercar Company, Pontiac, Mich., we selected, largely because of the manner in which it friction driven machine had distinguished itself pathfinding events through the swamps of that states



Flor SS._Anti-Vibration Devices Incornerated in the



The display of 1912 mounts at New York is quite in keeping with the opening of the new year. While it is true that many of the machines have been announced for some weeks, and the riders have had more or less opportunity to study their lines and special features, those who are directly interested in the matter of new designs are never quite satisfied until they have investigated their merits side by side and compared the various offerings in a critical manner. This annual inspection is now under way at the Madison Square Garden and will begin shortly at the Grand Central Palace, for it is understood there will be a few mounts at least at the latter show.

So far as it is possible to judge without studying the different models in detail, the manufacturers have provided a number of distinct innovations, although for the most part the offerings for 1912 may be regarded as embodying construction which has been tested thoroughly. The influence of touring, which may be considered as one of the developments of the 1911 season, is plainly noted. The machines present practical qualities, which will assist in placing motor-cycling even more firmly on a permanent basis. They are built both for business and pleasure, and the prospective purchaser will find it hard to make decision, though he will be assured of a successful mount no matter which he selects.

Many Clubs Organized.

It has been a great club year. Hardly a day has gone by without information of a new organization. For the most part these are sturdy, healthy bodies, which promise to aid substantially in spreading motorcycle doctrine. A large percentage of them have affiliated with the Federation of American Motorcyclists, with the result that that organization has enjoyed the most successful season of its history.

Closely related to the club idea is the matter of contests, and motorcycle racing also has had a good year. There seems to be abundant need for a revision of the rules governing this phase of the industry, and this is a matter which is now under consideration. Riders may expect to see the number of board tracks increased throughout 1912.

The Riding Situation.

The year closes on one of the most successful riding seasons the motorcyclist has known. Fostered by the Federation of American Motorcyclists, much more touring has been enjoyed than in the past. Riders have learned that it is possible to secure fully as much pleasure in covering long distances on their motorcycles as is to be gained with the automobile.

This feature has brought to light certain needs,

and chief among these may be mentioned the necessity for more uniform legislation. The situation in this regard is even worse than with the automobilists. Many states appear to have overlooked the motorcyclist in preparing motoring regulations, with the result that each town has a new set of rules and the tourist has difficulty in learning just what is expected of him.

The demand for universal lighting receives hearty endorsement from the motorcyclist. In fact, it may be said that motorcycling clubs were advocating this reform before the automobilists took it up. The various attempts to secure the passage of such laws in



Starting Out to Win with the Emblem During One of the Recent Meets at Detroit, Mich.

the several states will have the material aid of the riders.

Concerning the Records.

In the matter of racing records, the season ends with something very akin to chaos. Officially, Jacob De Rosier appears to be the chief professional record holder, the accepted times having been made with an Indian. Some of his marks have been lowered by Joseph Wolters and others on Excelsiors, but as yet these have not been accepted, officially. In the near future it may be possible to give a tabulated list of both professional and amateur records, but just at present there are so many claims and counter claims that it would be difficult to straighten out the tangle.



J. J. Cox of New York City, Well Known Indian Rider Who Recently Became a Professional.

New York Dealers Entertain.

The United Cyclists and Motorcycle Dealers' Association of New York City will entertain the visiting motorcycle, bicycle and accessory manufacturers, dealers and riders at a dinner in the Hotel Earlington, Jan. 10. An elaborate programme of speechmaking has been planned, and it is anticipated that the occasion will be one long to be remembered.

Planning Quarterly Trials.

Sometime during the show in the Madison Square Garden, riders from New York, Providence, Boston, Worcester and Springfield will meet at a little dinner somewhere in the big city for the purpose of discussing the possibilities of holding quarterly trials after the plan in vogue in England. The proposition contemplates holding these events from four cities, one event for each, at intervals of three months throughout the year. Considerable interest has been awakened, and it is practically certain that definite plans will be decided upon at the forthcoming dinner.

Hillman Presides at Meeting.

Vice President W. L. W. Hillman, who suffered a dislocated neck in a motorcycle accident last July, presided at the meeting of the Rhode Island Motorcycle Club, Providence, R. I., Jan. 3. This was not the first meeting Hillman has attended since his injury, inasmuch as he was present at the first session in December, but it is the first at which he has been called upon to take active part. When it is considered that for a long time after his arrival at the hospital it was feared he would never walk again, his recovery appears most remarkable. Naturally the members of the club are very much elated to find that he is recovering so rapidly. The annual meeting will be held Jan. 15.

More Official Repair Shops.

The following dealers have secured official repair shop signs, issued by the Federation of American Motorcyclists: W. T. Carter, 3662 South Main street, Los Angeles, Cal.; H. A. Coyne, Main street, Anaconda, Mont.; J. G. Nuebling, 649 Penn street, Reading, Penn.; W. F. Bracher, 82 South Second street, San Jose, Cal.; J. A. Webster, 117 Monroe street, Memphis, Tenn.; Frank Low & Son, 19 West Cota street, Santa Barbara, Cal.; J. W. Harper, 1012 Avenue D, Miami, Fla.; Motorcycle Sales Company, 627 Lacka-

wanna avenue, Germantown, Penn.; A. A. Stoddard, 705 Main street, Jacksonville, Fla.; Bidwell-Conklin Company, 2142 Broadway, New York City; Arthur W. Brush, Auburn, Neb.; Bowne Motorcycle & Auto Garage, 915 State street, New Haven, Conn.; Ernest A. Graddock, 24 North 52nd street, Philadelphia, Penn.; A. T. Zimmerman, 247 West Main street, Valparaiso, Ind.; William Voss, 417 North Adams street, Peoria, Ill.; A. T. Naylor, Salina, Kan.; Sutcliffe Company, 120 North Fourth street, Louisville, Ky.; Ferd Zelle, 110 Kansas avenue, Great Bend, Kan.; P. L. Abbott, 209 Fourth street, Portland, Ore.; A. S. Banta & Co., 174 South Second street, San Jose, Cal.

Providence's Race Track.

The proposition to construct a board track at Providence, R. I., is meeting with success. At the last meeting of the Providence Motorcycle Club, a committee consisting of J. J. Crawford, B. A. Swenson and Charles A. Anderson, was appointed to solicit funds. The projector guarantees to furnish half of the money if the motorcyclists of Rhode Island will raise the other half. It has been suggested that a company be incorporated, and that the riders be requested to purchase stock.

Providence Club Activities.

The annual meeting of the Providence Motorcycle Club, Providence, R. I., was held Jan. 3. The report of the secretary showed that 45 members had been admitted during 1911, and the club promises to increase rapidly in numbers, now that arrangements have been completed to secure permanent quarters in the new Indian "wigwam" at the corner of Blackstone and Broad streets.

The following officers were elected for the ensuing



Wilbur Johnston, Providence, R. I. Member of the Rhode Island Motorcycle Club, and His Excelsion.

CORBIN DUPLEX BAND BRAKE Motorcycle

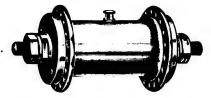


Models 18-18A 19 and 19A

CORBIN DUPLEX BRAKES AND HUBS

Corbin Motorcycle Front Hub

Knock-Out Axle



Model No. 17

Corbin Bicycle Front Hub





Corbin Rear Hub



Model No. 26

Corbin Duplex Coaster Brake



Model No. 8

Corbin Two-Speed



Model No. 10

Coaster Brake for Bicycles

COMPLETE CATALOGUE FURNISHED ON REQUEST

The Corbin Screw Corporation

THE AMERICAN HARDWARE CORP. SUCCESSORS

NEW BRITAIN

CONNECTICUT

year: President, E. L. Buffington, vice president, Frank E. Domina; secretary, John G. Edwards; treasurer, B. A. Swenson, captain, Charles A. Ander-



H. H. Wilcox of Newtonville, Mass., and the 1912 F. N. son; first lieutenant, Albert V. Howe; second lieutenant, Edward A. Lutz.

The annual banquet will be held at Perkins' Jan. 28 at 4 in the afternoon, when a chicken dinner, with all the "fixin's" will be served, followed by speech making.

The Holiday at Los Angeles.

A short programme of motorcycle events was held at Los Angeles, Cal., Christmas Day. The chief feature of the meet, a race between Jacob De Rosier on an Excelsior and Calbraith P. Rodgers in a Wright biplane, did not materialize on account of the high wind. A summary of the results of the other races follows:

Five miles, private owners—First, Jacobe, Indian; second, Sawaya, Indian; third, Bueneman, Thor; time, 4:57.

Eight miles, trade riders—First, Kinney, Indian; second, Jacobe, Indian, third, Sawaya, Indian; time, 7:55.4.

Ten miles, trade riders—First, Sawaya, Indian; second, Kinney, Indian; third, Jacobe; Indian; time, 9:21.

Minneapolis Delivery Van.

Since the commercial field has been entered by the motor truck, it has been apparent for some time that merchants of all kinds are in need of a light and absolutely dependable tricar for collecting and delivering parcels. The Minneapolis Motorcycle Company, Minneapolis, Minn., believes it has solved the problem with its new tricar delivery van, which is presented in an accompanying illustration.

The motorcycle portion is the same in every particular as the regular model N Minneapolis, having a unit power plant with two-speed transmission, multiple disc clutch, free engine and clutch control on the handlebar. It is claimed that a boy of average intelligence can learn to operate this vehicle in a very shot time, and that its maintenance expense will work of better than .5 cent a mile, which is a strong feature in its favor.

Christmas Racing at Oakland.

Three motorcycle events were scheduled for the Oakland motordrome, Oakland, Cal., Christmas Day besides automobile races and aeroplane flights. The motorcycle contests resulted as follows:

Six miles, professionals, two qualifying heats of three miles each:—

First heat—First, Wolters, Excelsior; second, Arm strong, Excelsior; third, Allbright, Indian; time 2:06.2.

Second heat—First, Seymour, Indian; second Ward, Indian; third, T. Samuelson, Indian; time 2:13.6.

Final—First, Ward, Indian; second, Armstrong Excelsior; third, Allbright, Indian; time, 4:11.8.

Five miles, amateurs—First, Walker, Indian; see ond, Lorenson, Indian; third, Kohl, Indian; time, no given.

Ten miles, free-for-all—First, Armstrong, Excelsior; second, Balke, Excelsior; third, W. Samuelson, Indian; time, not given.

New Members for December.

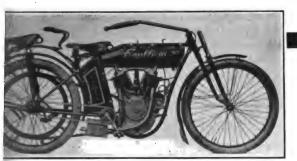
Two hundred and thirty-three members were added to the rolls of the Federation of Motorcyclists during December, according to the report of Secretary G. B. Gibson. These were divided according to districts as follows: Lake, 96; Atlantic, 39; Central, 27; Peninsular, 23; Southwest, 22; New England, nine; Pacific, seven; Gulf, five; Canadian, three; Insular, two.

Divided as to states, etc., the report follows: Ohio, 64; New York, 21; Kansas, 19; California, 14; Florida, 14; Pennsylvania, 12; Indiana, 11; Illinois, 11; Massachusetts, seven; Colorado, six; Michigan six; Tennessee, five; Nebraska, four; Texas, four; Canada, three; Georgia, three; Iowa, three; Maryland, three; New Jersey, three; Idaho, two; Missouri, two; Oregon, two; Philippine Islands, two; Washington, two;



New Tricar Delivery Mount Brought Out by the Minneapolis Company.

Wisconsin, two; Arizona, Connecticut, Minnesota, Mississippi, Montana, New Mexico, Oklahoma and Rhode Island, one each.



THE MACHINE YOU WANT AT THE PRICE YOU OUGHT TO PAY

YOU CANNOT FIND BETTER VALUE ANYWHERE AT EVEN HIGHER PRICE

Distributors for California-John T. This is only one of our several models for 1912. The Bill & Co., Los Angeles. For Oregon—Ballou & Wright, Portland. For Washington —F. M. Spinning, Seat-tle. For the South— 4 H. P. battery single at \$175, and the same machine with magneto at \$200; the 5 H. P. battery single at \$200 and its counterpart with magneto at \$225; and the big, powerful 7 H. P. magneto twin at \$250, gives dealer and rider a wide range for selection. And, most important of all-EVERY MACHINE FITTED WITH FREE ENGINE AND VARIABLE SPEED CLUTCH WITHOUT EXTRA CHARGE

Our line of famous motorcycles is the natural outcome of many years' experience in the manufacture of high grade bicycles. Also do not forget that we still are MAKING MORE AND BETTER BICYCLES THAN EVER BEFORE and if we are not represented in your vicinity it is strictly up to you to "Obey That Impulse" and write today for agency proposition.

EMBLEM MANUFACTURING CO. Member ANGOLA, ERIE CO., NEW YORK

Club Notes, Here and There.

Among the recent affiliations with the Federation of American Motorcyclists are noted the following: Lorain, O., 208, Clifford B. Tunte, secretary, 30 members; Cloud County, Kan., 209, Walter W. St. Pierre, secretary, Concordia, Kan., 14; Sidney, O., 210, Paul Monroe, secretary, 739 Court street, 17.

The Lorain Motorcycle Club, Lorain, O., has elected the following officers for 1912: George Williams; vice president, Edward Clotz; secretary, Clifford B. Tunte; treasurer, Harry Johns; captain, Dr. A. M. Webster; first lieutenant, Robert Parker; directors, John Kienzle and Edward Clotz.

The recently organized Quaker City Motorcycle Club, has secured quarters at 1032 West Girard avenue, Philadelphia, at which place the right hand of fellowship will be extended to all F. A. M. members

and tourists generally. The following officers have been elected: President, R. Bauerle; vice president, Harry Gerlack; secretary, William A. Stark; treasurer, John O. Kelker; financial secretary, A. Peters; captain, John Daniels; first lieutenant, Julius Walker; second lieutenant, Charles Deacon.

Henry Keidel &

Co., Baltimore,

Maryland.

John B. Quinn, 201 Ridge street, Fall River, Mass., a well known motorcycle dealer, is engaged in working up sentiment for an affiliated club. He has a large roomy garage, which he offers as a headquarters as long as the club elects to stay.

Burke C. Cook of the Warsaw Motorcycle Company, Warsaw, Ind., is hard at work in an effort to organize a local club which shall be affiliated with the federation.

Walter Holmberg, 539 Lake avenue, Duluth, Minn.,

INDIAN RIDERS

Cold weather is here, Motor turns over hard, Very hard work to get started. A little kerosene or gasoline injected into cylinder head will remedy this at once. A priming cup is needed in top of cylinder head, as it takes too much time to take out spark plug each time. Indian riders, send at once for a finely made and finished priming cup to fit top of cylinder head of your Indian. Price, postpaid, \$1 each. Money refunded if you are not satisfied.

B. A. SWENSON

298 Blackstone St., Cor. Prairie Ave. Previdence, R. I.

The F. N. Shaft-Drive Motorcycles

(The only machine in the world possessing this in-comparable feature.)

AMERICAN F. N. COMPANY

Boston, Mass.

Branches: 49 Union St., Prov., R. I. 415 Trumbull St., Hartford, Gt.

102 ... THE AUTOMOBILE JOURNAL.

reports hat he has a 100 per cent. F. A. M. club well

C. A. Basset, Burlingame, Kan., finds a disposition among local riders to organize a local club, but does not think there are sufficient men interested to secure affiliation.

The Lawndale Motorcycle Association, Chicago, which was organized June 15, 1911, reports a membership of 28. President J. C. Vesely, 1657 South 40th avenue, thinks the association will become affiliated with the national body in the near future.

Harry A. Ambler, 20 West Sherman street, Hutchinson, Kan., is considering the advisability of erecting a motorcycle garage. He reports a decided inclination among the riders of that vicinity toward the organization of an affiliated club as soon as they can secure suitable quarters.

The Buffalo Motorcycle Club, Buffalo, N. Y., has elected the following officers for the ensuing year: President, William G. Schack; vice president, Philip Goetzman; recording secretary, George Goetzman; financial secretary, M. D. MacDonald; treasurer, Howard W. Ganson; directors, O. H. Peters, R. H. Paddach, C. H. Andrews, J. L. Kellner, O. L. Neal, E. P. Seeber; captain, W. W. Cloudsley; lieutenant, George Tiefts.

The New Jersey Motorcycle Club, Newark, N. J., has chosen the following officers for 1912: President, George Post; secretary, Norman Davis; captain, P. W. Stevens.

A number of riders in Charleston, S. C., formed the Charleston Motorcycle Club at a meeting in that city, Dec. 22, electing the following officers: President, M. S. Sullivan; vice president, A. H. Lamb; secretary, P. L. Greenough; treasurer, H. Steenken; captain, F. C. Smith; first lieutenant, I. C. Breuer; second lieutenant, C. B. Farran.

The following well known riders are taking active interest in local motorcycling matters and the F. A. M., and have the nucleus of future affiliated clubs well in hand: H. A. Williams, Box 81, Amherst, O.; Maurice M. Welsh, Box 91, Delaware, N. J.; David Klein, 853 Newark avenue, Jersey City, N. J.; L. Westfort, Box 269, Meriden, Conn.; John A. Curren, Jr., Cohoes, N. Y.; R. C. Williams, Colling Block, Yor, Nah

Secretary R. E. Gilbert of the Colton Motorcycle Club, Colton, Cal., which was organized recently, makes the report that its affairs are rounding into shape, and he expects that affiliation papers will be forthcoming in a short time.

JOIN THE F. A. M.

which is the National Organization fostering the interests of motorcyclists along legislative and other lines. Cut this out, mail it, and you will get the reasons.

E. M. ESTABROOK

Chairman Membership Committee Federation American Motorcyclists,
BANGOR, MAINE.

Please	send	me	the	F.	A.	M.	Book	clet	and	all	infer-
mation	inter	resti	ng	to	pro	spe	ctive	m∙	mbei	s.	

Name	 	 	 • • • • •	 	
Addres		 	 	 	

MATSON VISITS THE TRADE.

Joseph Matson, the well known racing driver, is a tour of New England factories in the interests of the Mondex shock preventer and Disco self-starts with which many cars are being fitted during the 1912 season. Matson is seeing all the old clients at obtaining satisfactory results in enlisting new one from Boston comes the announcement that Harry of Grant has equipped his old Alco No. 18, with which won two Vanderbilt Cup races, with these devices and will use the car as a demonstrator of these products of the Aristos Company, New York City.

TWO NEW CLUBS IN INDIANA.

Two new automobile clubs have been organized in Indiana and both have been incorporated. The Northwestern Automobile Club of Indiana has an authorized capitalization of \$1500, the directors being C. C. Robinson, B. S. Gardner and E. E. Stephens, Indianapolis. At Terre Haute, the Terre Haute Automobile Association has been formed without capital stock. The incorporators named in the charter issued by the state include S. F. Lane, Charles Hatton, M. A. Steele and others.

DEATH OF PROF. WARREN S. JOHNSON.

Following an illness of more than two years Prof. Warren S. Johnson, president and treasurer of the Johnson Service Company, Milwaukee, Wis., died Dec. 5 at Los Angeles, Cal. Prof. Johnson was noted as an inventor and engineer. His company is the largest maker of thermostats and scientific heating apparatus and pneumatic clocks in the world, and has been engaged for years in the manufacture of pleasure cars and service wagons. Prof. Johnson was the first to advocate and promote the use of automobile vehicles in postal service.

FISK TIRES LAST FIVE YEARS.

Many owners of cars have been putting themselves on record with respect to the satisfactory service they have obtained from Fisk tires, made by the Fisk Rubber Company, Chicopee Falls, Mass. Reports of big mileages are almost daily occurrences at the factory. Recently a motorist in Fairport, N. Y., wrote that he had used the same set of Fisk tires on his Marion touring car for five seasons without having a puncture or blow-out, or taking a single shoe off the rim. Two of these are still in use, while the others have been worn so thin that they have been replaced with new Fisks.

CHANGES IN STUDEBAKER FORCE.

Sales Manager Paul Smith of the Studebaker Corporation, Detroit, announces the appointment of Frank H. Smith as assistant sales manager. C. E. Stebbins has been assigned the management of the branch in Sloux Falls, S. D., and H. W. Miller takes the management of the office force in the sales department vacated by Mr. Stebbins. C. R. Newby leaves the Sloux Falls branch to take charge of the Minneapolis branch, formerly managed by Mr. Smith.





The following concerns have been incorporated recently to manufacture and deal in motor cars, accessories, etc:

Stark Auto Company, Canton. O.; capital, \$20,000; incorporators, W. H. Burgener and others.

The Eckenroth Automobile Livery Company, Cleveland, O.; capital, \$5000; incorporators, Rudolph H. Eckenroth, Harry J. Eckenroth, Carlton F. Schultz, Hazel Eckenroth, Peter L. Eckenroth.

Westbrook Garage & Machine Company, Westbrook, Me.; capital, \$10,000; president, John T. Skillins; treasurer, Alexander Speirs,

Hart Motor Car Company, Chicago; capital, \$10,000; incorporators, Frederick P. Hart, Karl Byington. Charles G. Stohrer

Excelsior Motor Manufacturing & Supply Company, Chicago; capital, \$500,000; incorporators, Ambrose A.

Worsley, Max Loehwing, Samuel W. Jackson.

American Motor Sales Company, St. Louis, Mo.; capital. \$5000; incorporators, president, Clem T. Strauss; vice president, Freen B. Nulsen; secretary and treasurer, C. W. Waughop.

League of American Motorists, Camden, N. J.; capital, \$10,000; incorporators, S. Leon Gans, Harry N. Goldsmith, Frank Voight, 635 Linden street, Camden, N. J. North Shore Transportation Company, Lynn, Mass.; capital, \$5000; incorporators, Eben B. Phillips, Patrice

Theriault, James J. Liffin,

The Bethel Garage & Plumbing Company, Hartford, Conn.; capital, \$2000; incorporators, Ernest L. Taylor, Charles G. Anderson, Robert Halloran, Frederick Kirk, Herbert Leid, Charles Moore.

The Security Motor Switch Company, Detroit; capital, \$10,000; incorporators, John E. Cleveland, Albert Mead-

ows, Ezra P. Beechler.

Montana Auto Company, Helena, Mont.; capital, \$25,-000; incorporators, C. S. Caird, George Baxter, F. G. Ben-

Automatic Motor Devices Company, Milwaukee, Wis.; capital, \$1000; incorporators, H. B. Webb, James T. Drought, C. J. Delafield.

National Auto Turntable Company, San Francisco, Cal.; capital, \$200,000; incorporators, D. F. Ewart, W. H.

Buttner, L. Bearden, A. M. Meyenburg. Frontier Motor Car Company, Buffalo, N. Y.: capital, \$5000; incorporators, Elmer Harris, Winfield Graham, V. L. Hagstrom.

Hoof Brothers Company, Springfield, Ill.; capital, \$6000; incorporators, Alma C. Hoof, Grace B. Hoof, Harry

The Drummond Motor Company, Omaha, Neb.; capital, \$50,000: incorporators. James Drummond. W. B. Hughes, L. W. Scheibel, H. W. Yates, Jr.

Swanson Motor Car Company, Springfield, Ill.; capital, \$3000; incorporators, Charles E. Swanson, Elmer R. Challenger, Marshall E. Gallion.

Parkway Garage & Auto Supply Company, Chicago; capital, \$10,000; incorporators, Walter M. Groves, Charles P. Molthrop, Louis Thorsen.

Carroll Tire Company, Buffalo, N Y.; capital, \$20,000; incorporators, John Gregson, George Cunliffe, J. E. Greg-

Perfection Auto Tire Company, Chicago: capital, \$15,-000; incorporators, R. E. Cruzen, G. E. Cruzen, D. C. Hutchins.

Mechanical Appliance Company, Chicago; capital, \$200,000; incorporators, W. A. Feeny, Frank Venning, Southern Automobile & Machine Company, Hatties-

burg, Miss.; capital, \$50,000; incorporators, R. R. Boykin and others.

Empire Gear Company, Indianapolis, Ind.; \$20,000: incorporators, Frank S. Clark, Charles H. Hurd.
Detmar Auto Sales Company, New York City: capital, \$20,000; incorporators, John McLaren, B. F. Knowlton, Edward C. Underlied,

New England Auto Owners' Association, Springfield, Mass.; incorporators, R. A. McKee, A. W. Warren, M. T.

Workman.

Compressed Air Machine Company, Springfield, Ill.; capital, \$100,000; incorporators, Lewis C. Kiser and others.

Toledo Auto Delivery Service, Toledo, O.; capital, \$10,-000; incorporators, Charles K. Freidman, Joseph Strauss, Kittie Alexander, Joseph Alexander, Morris Tobias.

Morse-Readio Automobile Company, Springfield, Mass.; capital, \$15,000; incorporators, George U. Readio, Glenn E. Morse, Edward M. White.

White Motor Car Company, Worcester, Mass.; capital, \$5000; incorporators, Harvey L. Cashman, Paul M. Hale,

T. Francis Manion.

The Whitney, Barney Company, Boston; capital, \$100,-000; incorporators, Christopher F. Whitney, Charles H. Barney.

Morrill & Higgins Motor Company, Portland, Me.; capital, \$10,000; incorporators, Fred S. Higgins, George A. Morrill, A. D. Higgins, E. W. Freeman.

Worcester Elatro Company, Worcester, Mass.; capital, \$15,000; president, Fayette A. Amidon; vice president, Ira P. Smith; treasurer, Walter Warren.

Fort Garage & Sales Company, Greensboro, N. capital, \$10,000; incorporators, R. L. Markham. W. McGlamery, W. M. Combs.

Blakeslee & Norris Company, Thomaston, Conn.; capital, \$10,425; incorporators, Henry T. Blakeslee, Frank B. Norris, George H. Freeman.

Yale Auto-Garage Company, New Haven, Conn.; capital, \$1000; incorporators, Thomas P. O'Connor, Simeon W. Crompton.

Crim-Bronner Auto Company, Utica, N. Y.; capital, \$5000; incorporators, Horace D. Crim, Nellie B. Bronner, Charles W. Crim, Myron G. Bronner, Hubbard Motor Car Company, Clio, S. C.; capital, \$3000; president, J. L. Hubbard; secretary and treasurer, Hugh McLaurin.

Central Motor Company, Brooklyn, N. Y.; capital, \$10,-000; incorporators, Ralph Dubecq, Arthur M. Beres, H. Barradell.

Meyer-Koch Auto Company, Independence, Ia.; capital, \$10,000; incorporators, H. J. Wilson, William H. Koch, O. G. Meyer.

The Kocpke Motor Sales Company, Cleveland, O.; capital, \$30,000; incorporators, John C. Koepke, Edmund C. Hazel, Emma Koepke, H. P. Brownlee, Elmer G. Derr. Rex Motor Company, Boston; capital, \$1000; incorporators, Harold C. Stetson, Henry W. True, C. Frank

Moore.

The Weger Motor Company, Cleveland, O.; capital, \$100,000; incorporators, E. C. Rock, J. B. Seymour, E. A. Williamson, F. M. Lamoreaux, J. R. Updike

The Brooklyn Auto Top Company Brooklyn, N. Y.; capital, \$1500; incorporators, Solomon Segall, Benjamin Marvin, Paul C. Bahrenburg.

The Columbia Taxicab Company, Evansville, Ind.; capital, \$10,000; incorporators, H. E. Hulesman, W. Wheeler, A. C. Mathias.

The E. L. Brown Automobile Company, Swampscott,

Digitized by GOOGLE

Mass.; capital, \$25,000; incorporators, Edwin L Brown, Martin H, Randall, James D. Bee,

The Automobile Horn & Pump Company, Boston; capital, \$25,000; Incorporators, Joseph Payne, A. J. Son, Antoni Dubrawski

The Automobile Omnibus Company, Lynn, Mass.; capital, \$10,000; incorporators, Eben B. Phillips, Patrice B. Theriault, James J. Liffin.

The American Elastic Wheel Company, New York City; capital, \$50,000; incorporators, C. Feroci, F. Corsi, F. P. Ward.

The Norfolk Automobile Trade Association, Norfolk, Va.; capital, \$2500; president, Gray Coburn; secretary, W. S. Broderick; treasurer, J. K. Waterman.

GARAGE AND DEALER.

S. A. Foster & Co., Hartford, Conn., agent for the Rambler, Regal and American cars, has removed to a new garage and repair shop at 20 Elm street. The new location provides an excellent salegroom

location provides an excellent salesroom,

Leiss & Curtis has opened the Empire Garage at 124

Main street, New Rochelle, N. Y. Both members of the
firm have had a long experience in the motor car industry,

Mr. Leiss having had a garage at 232 Cedar road

Mr. Leiss having had a garage at 232 Cedar road.
Raiph S. Jones has purchased the business of the
Fishkill Motor Car Company, Fishkill Landing, N. Y..

will represent the Ford line,

The California Automobile Company, Los Angeles, Cal... is occupying its new quarters at Seventh and Hartford streets. The salesroom has a frontage of 125 feet. Both gasoline and electric vehicles will be handled by the company but in the garage these will be kent sensrately.

company, but in the garage these will be kept separately.

The Munger Auto Company, Dallas, Tex., has purchased a lot 50 by 100 feet on Commerce street, and will erect a model building to be used exclusively by the company. The structure will be three stories in height and will cost about \$20,000.

William F. Goodwin has purchased the interest of Joseph Etchells in the Biddeford Motor Mart, Biddeford Me., and will be sole manager of the business hereafter

Hansen & Tyler, Webster City, Ia., announces the purchase of a large tract of land on which will be erected a new garage in the spring.

L. Kirkegard, Sioux City, Ia., has opened a garage and repair shop and will represent the Oakland. R. C. H. and Firestone-Columbus,

G. E. Carlson, Main street, Middletown, Conn., is enlarging a building on Church street which will be utilized for the storage of motor cars.

Kimmel Bros., 215 North Fourth street, Columbus, O. has taken on the Cole line in addition to the Speedwell

The Wyoming Garage, C. H. Moulthrop, manager. Scranton, Penn., has been appointed agent for the Ohio car, made by the Ohio Motor Car Company, Cincinnati, O



Factory of Haynes Automobile Company at Kokomo, Ind., the Six Buildings of Which Provide a Floor Space of 400,000 Square Feet,

and the garage which is undergoing alterations. C. F. Aldridge will be manager and J. J. Wedick will have charge of the mechanical department.

Harry Minchin has opened a machine shop for motor car work at 48 Lafayette street, Greenwich, Conn.

Uliman Bros., Springfield, Mass., has awarded a contract for a garage to be erected on Market street. It will be two stories in height

John R. Jones, Atlanta, Ga., has purchased the Rome Motor Car Company from A. R. Sullivan. Varnell Chambers will manage the new concern.

Arthur F. Clough, formerly with the J. S. Harrington Company, Worcester, Mass., is now associated with the Palace Auto Company of that city.

The Piedmont Motor Car Company, Charlotte, N. C., which was incorporated recently expects to open its new garage and repair shop in the near future.

garage and repair shop in the near future.

The Elmer Automobile Company, Hartford, Conn., opened its new salesroom at Trumbull and Church streets, recently.

W. H. Vinal has closed a contract with the Pullman Car Company, York, Penn., for the eastern Massachusetts territory, and will assume the management of the Pullman department of the Boston Motor Car Company, Boston.

The Perry Automobile Company, Montpelier, Vt., has leased the new Martin garage completed recently and

G. Pierce, a former Associated Press man, has joined the Colt-Stratton Company, New York City, and will take charge of the company's promotion department.

take charge of the company's promotion department.

C. F. Cole, the head of the Cole Motor Car Company.
Denver, Col., has made arrangements for the building of a new sales and service department on Auto Row.

J. R. McKinley & Co. has purchased the Estancia garage at Willard, N. M.

garage at Willard, N. M.

Henry P. Bryant has acquired the interest of Harry
Garrison in the Marshall Motor Company of Marshall.

Garrison in the Marshall Motor Company of Marshall Mo., and will have charge of the entire business hereafter.

J. H. Van Cloxier, Kansas City, Mo., has been granted a building permit to erect a garage at 207-211 West 14th street. It will be constructed of reinforced concrete and will cost \$20,000.

The American Motor Sales Company, Syracuse, N. I. has taken on the Cole line, in addition to the American and the concern will be known in the future as the American-Cole Motor Company,

Charles Bellin Sons' Company, Cincinnati, O., is making extensive alterations and improvements to its sales rooms at Vine and 15th streets.

The White Motor Car Company of Cleveland, O. is making plans to erect a two-story brick and concrebuilding to be utilized as a garage and salesroom at Craig and Atherton streets, Oakland, Penn,

Raiph F. Coburn has been placed in charge of the itoddard-Dayton Sales Company, with headquarters at 94 dassachusetts avenue, Boston.

Leville P. Bucklin has been appointed general manater of the Fred E. Gilbert Company, Jacksonville, Fla., o succeed John E. Kay. Bucklin was formerly connected with the Florida Times-Union.

Edward Baden, Independence, Kan., has leased the schoenfeldt building and after extensive alterations will pen a first class garage. He represents the Overland.

nade by the Willys-Overland Company, Toledo, O.

A. H. Stephens and Wilbur Johnson have taken charge of the Viertel garage. Main street, Booneville, Mo., and will make extensive alterations, including the fitting of machine shop. The firm will include tire repairing

imong its departments.

The Southwestern Cole Company, Dallas, Tex., has been appointed distributor of the Cole line, made by the Cole Motor Car Company, Indianapolis, Ind., and will have a large share of the Texas, Oklahoma and Arkansas The officers of the company are: President, territory. W. F. Bridwell; vice president, W. Y. Foster; secretary and treasurer, C. B. Foster; general manager, C. F. Hurst, F. J. Bohn, Arlington, Cal., will erect a brick garage,

50 by 80 feet, on Magnolia avenue.

The Pathander Motor Car Company, Los Angeles, Cal., has leased the building at Pico and Hill streets, former-

ly occupied by the Los Angeles Motor Car Company.

Thomas Botteriii, one of the oldest motor car dealers in Denver, Col., is occupying new quarters at 1274 Broadway, that city. The new structure is of pressed brick and is 50 by 125 feet. The salesrooms and offices are on the ground floor.

The Big Cedar Auto Company, Osage, La., has succeeded the West End Garage, Benjamin Colton and B. K. McIlinay were the purchasers and they will conduct a garage and handle the Overland and Ford lines,

W. J. Leguerrier has opened a garage and repair shop at 5020 Easton avenue, St. Louis, Mo. He will also con-duct a second hand automobile business.

The National Automobile Training Association, Omaha, Neb., has purchased a tract of land on Twentieth street. and will erect a garage for gasoline and electric vehicles

The Newton-Humphreyville Company, Newark, N. J., is occupying new quarters at 124 Washington street, which will be used jointly with the Ellis Motor Car Company until the latter's new building is ready for occu-

WITH THE MANUFACTURER.

The Boston branch of the Velle Motor Vehicle Company, Moline, Ill., will be represented at the New York show by Harold D. Bornstein, manager; James Coggestein, New England travelling representative, and McKie, manager of the commercial department

Cole Agencies appointed recently are as follows: Savannah, Ga., M. A. Hayn; Red Bluff, Cal., F. W. Decker: Sacramento, Cal., E. C. Smitton; Stockton, Cal., Novelty Garage; Watsonville, Cal., E. B. Gilbert; Dixon, Cal., J. A. Spates: Colusa. Cal., Wood Yerxa: San Bernardino, Cal., E. A. Levreau; Youngstown, O., Ralph P. White; Freeport, Ill., D. E. Sunderland; Collins, Miss., W. R. Holloway; Urich, Mo., Robert McCov way: Urich, Mo., Robert McCoy.

J. H. Newmark, for four years advertising manager of the Oakland Motor Car Company. Pontiac, Mich., has resigned that position, having been advanced by the General Motors Company to the advertising department of the parent organization in Detroit, where he assumed

his new duties recently,

The Moon Motor Car Company, St. Louis, Mo., recently added another floor to its building at Main and Douglass streets to increase its capacity for the manufacture

of automobiles and supplies,

The Boston branch of the Velie Motor Vehicle Com The Boston branch of the Velle Motor Vehicle Company announces that a contract has been closed with Nelson A. Seymour to handle the Velle line of pleasure and commercial vehicles in South Lancaster. Mass.

The Ohio Motor Car Company. Cincinnati, O, in addition to showing a full line of 1912 models at New York will exhibit at Chicago and Boston.

The Randolph Motor Car Company of Flint, Mich., has been sold by the General Motors Company to Eugene G. Goldman of Chicago. The latter owned the plant iwo

Goldman of Chicago. The latter owned the plant two years ago

James F. Evans was appointed advertising manager of the Lozier Motor Company, Detroit, recently, succeeding C. A. Emise, who took the place of F. C. Chandier as sales manager. The latter is now general manager. Mr. Evans has become well and favorably known to the automobile industry and was at one time advertising manager of the Brush Runabout Company, Detroit.

The Haynes Automobile Company, Kokomo, Ind., occupies a plant covering an area of 7.5 acres of ground and the six buildings provide a floor space of 400,000 square feet. In the accompanying illustration is depicted the structures which are fire proof, being of con-

crete, steel and brick.

The Bright carburetor will be manufactured by a company incorporated at Indianapolis, Ind., composed of the following: S. M. Brundage, Ulric Z. Wiley, Clifford Arrick, Harry S. Rominger and Dr. C. E. Day, The vaporizer invented by Martin C. Bright has a gravity automatic feature which it is claimed will prevent flooding or choking the motor.

J. F. Gfrorer has been placed in charge of the Alco service department of the American Locomotive Com-pany, New York City. Since joining the company he has been engaged in special work. He has been asso-ciated with the automobile industry since 1903, having filled several important positions for well known companies.

The Briggs-Detroiter Company, Detroit, a recently in-corporated concern, has secured a factory plant comprising about two acres of ground north of Holbrook avenue

in that city.

The Firestone Tire & Rubber Company, Akron, O., opened a direct factory branch at 1521 Commerce street, Dallas, Tex., Jan. 1. It will be under the management of P. B. Talbot, for many years a travelling salesman for the company.

The Kerosene Gas Producer Company, whose plant is at Long Island City, N. Y., announces the opening of a sales office at 1926 Broadway, New York City, and requests that all communications in reference to its product

be sent to that address.

The Remy Electric Company, Anderson, Ind., announces the opening of a service station at Dallas, Tex., where users of the Remy ignition devices will be taken care of. The department will be in charge of M. A. Price, formerly connected with the New York City branch.

C. E. Stebbins, head of the order department of the Studebaker Corporation's E-M-F factories, has been assigned to the management of the Sioux Falls, S. D., branch. His associates presented him with a handsome travelling bag upon his departure from Detroit.

The Hartford Suspension Company, Jersey City, N. J., has opened a factory branch at 1524 Grand avenue, Kan-

sas City. Mo. Henry Riemer is manager.

W. F. Byrket, formerly of the Newcastle factory of
the Maxwell-Briscoe Motor Company, has been appointed manager of the Indianapolis, Ind., branch of the United States Motor Company, New York City. Thomas L. Marshall, who assumed charge of the branch temporarily, has been appointed assistant superintendent of the central sales district. The territory includes practically all of the central states.

The Auto Appliance Manufacturing Company, Akron, O., which is making a self-starting device for motor cars, and which was incorporated recently, has elected the following officers: President, J. W. Miller; vice president, J. A. Swinehart; secretary and general manager, A. Auble, Jr.; superintendent, C. W. Steele; sales manager, C. C.

Walker.

The Stuyvesant Motor Car Company, Cleveland O., has taken over the Grant-Lees Machine Company and a new \$350,000 corporation has been formed to manufac-ture on a large scale the Stuyvesant, or rebuilt Gaeth car. Ground has been broken for a \$65,000 building adjoining the plant of the Grant-Lees Machine Company, and 50,-000 feet of additional floor space in the latter building will be utilized by the mechanical department. About 165 machinists and 200 others will be employed as soon as the new structure is completed. The new company expects to produce about 100 cars by July 1.

Albert H. Doolittle, advertising and publicity manager of the Knox Automobile Company, Springfield, Mass., has resigned his position. He is well known to the trade through a long practical automobile experience which has taken him through every step of motor car manufacture, distribution and advertising, so that his new ven-ture as a specialist in this class of publicity will be followed with interest.



LARGE FOREIGN OVERLAND SHIPMENT.

One of the largest foreign shipments of American cars left the Willys-Overland Company, Toledo, O., bound for New York City whence eight different steamships will carry Overland automobiles to 11 different countries. Thirty-five flat freight cars were required for the 90 automobiles which comprised touring cars and roadsters and the total value of the shipment is placed at \$125,000, which President John N. Willys declares is but the first of a series which will be made to every part of the civilized world.

The countries to which the machines were shipped and the number to each are as follows: Australia, 33; New Zealand, 15; Tasmania, three; South Africa, two; Brazil, two; Holland, two; Puerto Rico, seven; Uruguay, five; Peru, two; England, 17, and the Philippines, two. C. W. Eggers, traffic manager of the company, was in charge of the shipment and accompanied it to New York City.

NEW FIRESTONE TIRE.

A cushion tire for electric machines has been brought out by the Firestone Tire & Rubber Company, Akron, O., which claims for it decided easy riding qualities. This has been accomplished by giving the old Firestone special electric tire a double



Firestone Cushion Tire for Electrics: Smooth Tread at Left, Anti-Skid at Right.

or dual tread and by adding internal cavities at frequent intervals in the base, directly under the tread where the full cushion effect may be secured.

The dual tread was introduced in motor truck tires produced by the Firestone company some five years ago and immediately came into general use. It acts not only as a cushion, but also as a partial skid preventer. By placing the cavities wholly within the tire an exceedingly neat and attractive appearance is secured, as may be noted from examination of the accompanying illustration.

No change has been made in the quality of the rubber, as this has been found to give the utmost satisfaction for electric use, and at the same time to consume the least current. To obviate creeping and ensure a firm fastening on the wheel at all times, the sidewire method of attachment is employed.

WHITE SECURES PERFECT SCORE.

The first White six-cylinder 60 horsepower car delivered by the White Company, Cleveland, O., took part in the recent "Around Georgia" tour, securing a perfect score. The itinerary consisted of 900 miles, and was so planned as to include those highways in the state which were most in need of improvement.

MANY FACTORY MEN AT SHOWS.

Many factory representatives of manufacturing concerns will be in attendance at the national automobile shows in New York City, among them being the following:

Michigan—O. C. Hutchinson, F. W. Kurtz, Marquette. R. C. Hupp, F. R. Bump, H. C. Dart, W. D. Little, F. L. Baker, L. G. Hupp, R. C. H.; C. D. Hastings. J. Walter Drake, R. G. Neighbors, C. H. Dunlap, J. O. Harris, F. J. Mooney, Hupmobile; E. R. Benson, E. C. Howard, K. P. Mooney, Hupmobile; E. R. Benson, E. C. Howard, K. P. Drysdale, Cadillac; J. E. Finney, N. A. Merritt, C. H. Wilson, J. G. Bayerline, George D. Wilson, W. H. Bradford, Warren; Vincent Link, V. K. McBride, Universal truck: George W. Crittenden, L. W. Taylor, Lawrence Moore, K.-R.-I-T; E. H. Broadwell, E. C. Morse, C. C. Winningham, P. D. Stubbs, R. D. Chapin, R. B. Jackson, Hudson: W. E. Flanders, Harry Cunningham, Paul Smith, C. H. Booth, E. LeRoy Pelletier, Frank Shaw, Leigh Lynch, H. N. Miller, Frank Witt, William Lane, E-M-F and Flanders; H. W. Ford, Chalmers; J. D. Dort, Fred Weiss, W. F. Pfanders, H. J. Sauvage, Durant-Dort; H. R. Bradford, Victor Shaw, R. A. Palmer, F. J. Campbell, Carter ford, Victor Shaw, R. A. Palmer, F. J. Campbell, Cartercar; J. A. Thorson, L. B. Sanders, S. H. Humphrey, Lion; F. C. Finkenstaedt, National truck; H. A. Matthews, H. E. Matthews, Jackson; R. P. Bishop, F. L. Holmes, C. D. Matthews, Jackson; R. Cutting, W. E. Clarke, George McQuellan, Neil Crowhm. Cutting; A. M. Bentley, T. A. Harris, W. B. Engler, Rellance truck; E. R. Stoughton, H. L. Winter, M. L. Pucher. A. F. Peck, Federal truck.

A. F. Feck, Federal truck.

Ohio—L. H. Kittredge, E. H. Parkhurst, F. I. Harding.
G. B. Siddall, W. H. Staring, R. J. Schmunk, Peerless: C.
W. Mears, C. W. Churchill, Winton; Henry Foote, Baker
electric; H. H. Hower, Stearns; T. C. Whitcomb, F. E.
Wilson, J. C. Cavanaugh, Marion; B. A. Gramm, F. E.
Lamb, W. H. Moore, A. M. Pearson, Gramm truck; H. S. Diller, M. Hendrickson, Lauth-Juergens truck; A. E. Schafer, H. T. Bouldon, William Krafer, D. W. Rudesil. Ohio; G. B. Aldrich, W. A. Baxter, Dayton truck; G. J. Loomis, Speedwell.

Indiana—P. B. Day, Charles L. Rogers, John L. Sternberg, P. L. Creighton, E. Mack Morris, Great Western: C. H. Walters, F. W. Walters, E. F. Blue, A. W. Patty. C. H. Walters, F. W. Walters, E. F. Blue, A. W. Patty, De Tamble; H. O. Smith, J. G. Monihan, R. W. Macey, Ray F McNamara, Premier; J. J. Cole, C. S. Crawford, C. P. Henderson, L. S. French, H. C. Bradfield, R. P. Henderson, Cole; Ray Harroun, Fred D. Clinton, E. C. Miller, H. H. Rice, Marmon; A. C. Newby, George M. Dickinson, William G. Wall, James M. Clarke, P. P. Willis, F. D. Manning, National; H. M. McFarlan, A. H. McFarlan, C. E. Foster, McFarlan; H. E. Shiland, A. K. McLinny, W. D. Mercer, H. L. Ashlev. Westcott

E. Foster, McFarlan; H. E. Shiland, A. K. McLinny, W. D. Mercer, H. L. Ashley, Westcott.

Wisconsin—W. L. Day, J. W. Glison, Mitchell; F. K. Bull, F. Lee Norton, J. G. Cowling, R. B. Coleman, C. J. Farney, G. A. Dechant, M. C. Meigs, J. A. Sloan, Harry Murray, F. L. Allen, A. H. Ekberg, Case.

Illinois—C. H. Vandervoort, F. G. Salisbury, L. A. Gerisch, Moline; W. L. Velie, Major Fuller, S. H. Velie, C. D. Velie, George Peck, George H. Lloyd, C. B. Rose, H. T. Wheelock, Velie,

Massachusetts—H. A. Knox, W. G. Morso, P. A. Willing, M. S. Morso, P. A. Willing, M. M. M. Willing, M. M. M. M. Willing, M. M. M. Willing, M. M. M. Willing, M. M. M. Willing, M. M. M. M.

Massachusetts—H. A. Knox, W. G. Morse, P. A. Williams, Jr., Atlas: Harry Unwin, R. L. Morgan, Morgan truck; Harry Fosdick, Merrill White, C. W. Richards, William M. Remington, Stevens-Duryea; W. H. Schwartz. Metz.

New York-G. M. Davis and others, Pierce-Arrow: J. L. Suyden and others, Thomas; J. G. Barker, L. A. Mackay, R. La Porte, H. H. Franklin, A. Holmes, G. A. Bryant, Franklin.

ant, Franklin.

Pennsylvania—W. G. Shepherd, C. W. Matheson, C. E. Wertman, R. G. Wilson, G. S. Da Lang, R. A. Foye, H. H. Pease, A. M. Dean, F. F. Matheson, Matheson; H. M. Sternberg, R. E. Graham, S. G. V.; J. A. Kline, W. P. Sing. Kline-Kar.

New Jersey-E. H. Sherwood, William T. White. Mercer.

-E. J. Moon, T. T. Fauntleroy, F. A. Flint, S. Missouri-McDonald, Moon.

Automobilists should advocate uniform motoring laws. because in no other way can the present confusion of interstate touring be avoided.



GREGORY HEADS CHICAGO CLUB.

Charles E. Gregory, treasurer of the Chicago Motor Club, was elected president of that organization at the recent annual meeting. David Beecroft, who completed his second term as head of the club, was tied in the number of votes cast for the office of director, but retired in favor of his opponent. The following is the result of the election: President, Charles E. Gregory; first vice president, Gaylord Warner; second vice president, Richard J. Finnegan; secretary, W. E. Stainaker; treasurer, Henry Paulman. The following directors were chosen: J. P. Frisby, W. J. Zucker, H. N. Fowler, W. D. Foreman and E. A. Hearne.

JERSEY MOTORISTS COMBINE FORCES.

The joint legislative committee of the automobilists of New Jersey has been appointed for the purpose of urging the passage of repeal legislation during the coming legislative session. This is composed of 15 members as follows: George Blakeslee, George Smith, Louis Fitzgerald, W. H. Ellis and George Paddock, representing the New Jersey Automobile Trade Association; Hon. W. Eugene Turton, Joseph H. Wood, W. Clive Crosby, J. H. Edwards and George Post, the Associated Automobile Clubs of New Jersey, and Richard C. Jenkinson, C. O. Groebe, Ira Kipp, Jr., Horace P. Cook and Melville A. Carpenter, the New Jersey Automobile & Motor Club.

RENAULT BRANCH REMOVES.

George De Wilde, a director of Renault Freres, Billancourt, France, maker of Renault cars, has been in America the past week for the purpose of arranging for the removal of the Renault Freres Selling Branch in New York City to new quarters at Broadway and 63rd street. N. Nason Morris, who has been subagent for the company for the past six years, becomes sales manager for the United States and Wallace Owen has been appointed as his assistant.

RULING FAVORS MOTORISTS.

Automobilists of Rhode Island and visiting motorists will be pleased to learn that the officials of the Rhode Island Company, which operates the trolley service in that state, has issued an order to motormen to shut off the arc searchlights when approaching a wagon or a motor car 300 feet away. The railroad commission has been informed of the rule which was voluntary upon the part of the company. During the past season tourists and residents of the state have complained of the powerful lights used on the electric cars.

MOTORIST FOR ROADS SUPERVISOR.

W. E. Moyer, president of the Iowa State Automobile Association, president of the Des Moines Automobile Dealers' Association, and a prominent worker in the interest of good roads, has declared his willingness to become a candidate for county supervisor at the June primaries. His friends are working for him as are all those interested in the good roads move-

ment. It is believed that his election will accomplish considerable in the betterment of highway conditions as Mr. Moyer is energetic and has filled many positions in public enterprises.

SUGGEST NEW TRAFFIC RULES.

The downtown board of the Chamber of Commerce, San Francisco, Cal., has decided to submit two proposed city ordinances to the supervisors with a view to regulating traffic. One would prohibit any and all classes of vehicles from standing on Market street longer than 20 minutes, and only when they are within six inches of the curbing. This is to apply to certain sections in the vicinity of the street named. The second is to compel all drivers of motor cars, other than owners, to pass an examination and be licensed by the city. The applicant must be over 21 years of age, of experience in his work and of good moral character.

STUTZ BACK FROM EUROPE.

Harry C. Stutz, chief engineer and factory manager of the Ideal Motor Car Company, Indianapolis, Ind., maker of Stutz cars, returned from abroad recently, where he inspected several European factories in connection with a pleasure trip. He was of the opinion that as a whole the American motor car factories seem to be more progressive than those abroad, and that the makers in this country are producing cars of a greater value for less money than those in England and on the Continent.

CHIEF AFTER SPEEDERS.

Chief of Police Lindsey of Louisville, Ky., has inaugurated a campaign against motorists who violate the speed laws and has taken a personal interest by means of an Oldsmobile car which was purchased by the Board of Public Safety for the use of the official. During the first day of service the machine was utilized to overhaul several drivers who attempted to escape by putting on full speed.

WILL TEST MOTOR CAR LAW.

Automobilists of Alabama are much interested in the outcome of a test case being conducted by Montgomery motorists regarding the automobile law, which is alleged to be a violation of a section of the state constitution. The law provides that the tax shall be paid to the state in lieu of property tax in different towns. This is said to conflict with the constitution and the case will be carried to the supreme court.

WOMAN TO DEMONSTRATE ELECTRIC.

Among the advantages of the electric pleasure vehicle is that it is neat and clean and operated easily by the fair sex. To illustrate the practicability of the machine, the Hupp-Yeats Corporation of Boston has engaged Mrs. D. M. Craig to demonstrate, sell and teach women how to drive the Hupp-Yeats electric. She is said to be the first woman in Boston to occupy this novel position.

Uniform motoring laws would end the needless confusion attendant upon interstate touring. Now is the time to advocate their passage.

COLE ADOPTS LONG STROKE MOTOR.

Announcement is made by the Cole Motor Car Company, Indianapolis, Ind., that a long stroke motor has been brought out for the five-passenger convertible seven-passenger touring car. The first model equipped with the new self-starter and electric lighting adopted recently, was displayed at the motor car show in Buffalo, N. Y. The new machine is called the model DD, and has a 4.5-inch bore and 5.25-inch stroke.

"This adoption comes," says Chief Engineer Charles Crawford, "in accordance with foreign practise and success. But in making our selection we do not believe we have made a radical movement with respect to size of bore and stroke. The excessive long stroke on some foreign cars has been caused by tax laws, these being governed by the bore of the engine. In this matter design and efficiency have been overlooked to get increased horsepower by stroke. Such motors meet with more success in foreign countries because of the excellent highways, but in building a car for our roads the relationship of the bore to the stroke must necessarily be different."

A number of improvements have been made upon the new model. A special plain bearing is utilized for the fan, of the three-blade aeroplane type, giving maximum efficiency with minimum weight. Water pump is anchored to crankcase and the fluid in cylinders instead of being taken from the centre of these members is taken directly from the sides of the valves, insuring better circulation around these parts. Hardened and ground spring shackle bolts with bronze bushed eyes are employed. The gear shift is placed on the inside of the fore door. The extra seats, upholstered in hand buffed leather with folding bottom, are built for this model, brackets being provided to receive these extra members whether the seats are furnished or not. The body is mounted on the 122inch wheelbase of the Cole chassis and 36 by fourinch tires of the Firestone demountable type are employed.

WHY SELLING METHODS CHANGE.

"System is becoming the watchword among motor car manufacturers and selling agencies," says Harry W. Griffith, secretary-treasurer of the Remy Electric Company, Anderson, Ind. "Two or three years ago the theory of the automobile business seemed to be based upon a desire to get the money rather than the business. There was not a proper regard for the detail of selling management.

"At first business was good and the demand for machines was always greater than the supply. Dealers were getting cash for their products. They did not have to think about forming a selling organization. If a car was made to look good, rather than to perform well, it could be sold. This was a good business condition only so long as the automobile was a fad rather than a practical commodity, and while the production and sale of cars was considered a 'game' and not a dignified industry.

"When it was realized that the automobile and the motor truck were valuable allies for commercial purposes, the manufacturers and sales organizations began to plan ways and means to meet the new conditions. The demand increased, but a different class of buyers was developed. More business men bought cars and this meant that the theory of selling had to be changed. A systematic selling organization had to be perfected. This condition not only applies to cars but to the production and sale of accessory parts as well."

CHRISTMAS MEET ON PACIFIC COAST.

Three automobile races, each covering a distance of five miles, were held on the Oakland motordrome, Oakland, Cal., Christmas Day. The events were sufficiently interesting to attract a representative crowd, though no drivers of national importance took part. The summary follows:

Five miles—First, Cooper, Comet; second, Deveau, Buick; third, Agraz, Maxwell; time, 5:12.4.

Five miles, handicap—First, Deveau, Buick; second, Agraz, Maxwell; time, 4:45.8.

Five miles, handicap—First, Cooper, Comet; second, Agraz, Maxwell; third, Deveau, Buick; time, 4:41.

WORCESTER BUYS VELIE ROADSTER.

Among the recent agencies appointed by the Velie Boston Branch, was the Acme Motor Car Company, Worcester, Mass., which will handle the full line of Velie pleasure and commercial cars in the southern section of Worcester county. After making a thorough study of the construction, workmanship and service policy of 15 different makes the city of Worcester has purchased through the Acme Motor Car Company, a Velie torpedo roadster for the use of the street department. Inasmuch as service stations are maintained by all Velie branches and agencies, the city of Worcester will secure the benefit of this policy.

BAY STATE MOTORISTS MEET.

The annual meeting of the Bay State Automobile Association, Boston, was held Jan. 1. A year ago the report of the treasurer showed an outstanding indebtedness of some \$600. Not only has this been paid off but the organization now has a good balance in the bank. The following officers were elected for the ensuing year: President, E. A. Gilmore; vice president, Harry W. Knights; treasurer, J. S. Hathaway: secretary, C. P. Rockwell; directors, Augustus B. Henley, Burton G. Ellis, M. H. Gulesian, Horace G. Kemp and Chase Langmaid.

CASE INCREASES CAPITAL.

Announcement is made from Racine, Wis., that the capital stock of the J. I. Case Threshing Machine Company, maker of Case cars, has been increased from \$5,000,000 t. \$40,000,000. This additional capital is to be secured for the purpose of extending the field of the concern's operations. Enlargements to the factory are to be provided for an increase in the production of farm implements, and aeroplanes and aerial motors are mentioned as a part of the future business.



EXPORTS AND IMPORTS.

The report of the Department of Commerce and abor for the month of October shows exports of utomobiles and parts valued at \$1,356,384 as against 771,639 for the same month in 1910. The imports or the month were valued at \$238,457, as compared vith \$149,328. In the matter of cars and value, lassified according to countries, the report shows the ollowing:

Imports for October

T 1111 P	DI'IN I	o.	october.		
	_		1910	1	911
Country		o.	Value	No.	Value
Inited Kingdom		4	\$9,821	22	\$54,054
France			63,704	35	67,896
Germany		7	16,354	16	34,738
[taly	1	3	25,789	15	23,449
Others		5	10,251	15	26 ,922
		59	\$125,919	103	\$207,059
Ex	ports 1	for	October.		
United Kingdom			\$115,158	213	\$237,109
France			19,898	14	19, 582
Germany			23,250	5	5,744
Italy			1,937	6	3,782

20,994

52 33,892

Mexico	30.021	23 23	39,580 21,195
South America	32,390	102	100,066
British Oceanica		262	248,985
Asia	65.966	42	35,262
Other countries	25,759 	17	20,272
539	\$771,639	952	\$1,043,093

WHITNEY ORGANIZES NEW COMPANY.

C. F. Whitney of Boston, well known in New England motor car circles because of the long connection with the Park Square Automobile Station, and president of the Commercial Vehicle Dealers' Association of that city, and C. H. Barney, formerly connected with the industry, have formed a new company to handle Selden and Lion pleasure cars and Gramm trucks. Fred H. Lucas, also one of the Park Square Automobile Station force, will become retail sales manager of the new concern. Salesrooms will be located at 823 Boylston street, while a service station will be maintained in the Shoe & Leather building. Cambridge, for accommodation of users of these cars.



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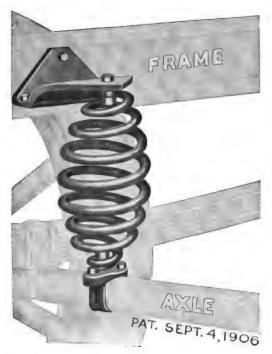
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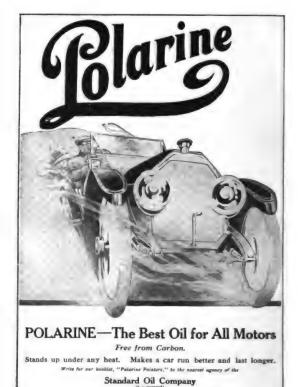
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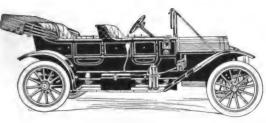
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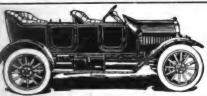
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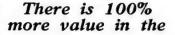
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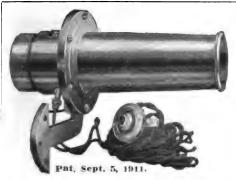
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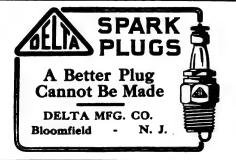
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Paige-Detroit Motor Car Co., Detroit, Mich. (Paige-Detroit.)

Peerless Motor Car Co., The, Cleveland, O. (Peerless.) Branches: 660 Beacon St., Boston, and 57th St., Mass.; Broadway New York City; Michigan Ave. and 25th St., Chicago, Ill.

Pierce-Arrow Motor Car Co., Buffalo, N. Y. (Pierce-Arrow.)

enault Freres Selling Branch, Broadway and 57th St., New York Renault City (Renault).

City (Renault). Branches: 1606 Michigan Ave., Chicago Ill.: 116-120 Van Ness Chicago, Ill.; 116-120 Van Ness Ave., San Francisco, Cal.; Motor Mart. Boston Mass.

Reo Motor Car Co., Lansing, Mich. (Reo.)

Sampson, Alden, Mfg. Co., 61st St. and Broadway, New York City. (Sampson 30.)

Motor Saies Co., India- Selden Motor Vehicle Co., Rochester, Renault N. Y. (Selden.)

Ave., Dayton, O. (Speedwell.)
United States Motor Co., Broadway
and 61st St., New York City (Brush, Maxwell, Sampson, Stoddard-Dayton, Columbia.)

Warren Motor Car Co., Detroit.

Mich. (Warren-Detroit.)
White Co., The, \$28 E.
Cleveland, O. (White.) 79th St., 320 Newbury St. Bos-Branches: ton, Mass.; Broadway and 62nd St., ton, Mass.; Broadway and vend S., New York City; 629-633 North Broad St., Philadelphia, Penn.; 138-148 Beatty St., Pittsburg, Penn.; 610 S. Michigan Ave., Chicago, Ill.; Market St., and Van cago, Ill.; Market St. and Van Ness Ave., San Francisco, Cal.; 120-122 Marietta St., Atlanta, Ga.; 74 Victoria St., Toronto, Can.

Willys-Overland Co., Toledo, (Overland.)

CARS—ELECTRIC PLEASURE.

CARS-STEAM PLEASURE

White Co., The, 828 E. 79th St., Cleveland, O. (White.) Branches: See Cars - Gasoline Pleasure.

CARS-GASOLINE COMMERCIAL.

Atlan Motor Car Co., 104 Birnie Ave., CARS-FIRE, POLICE AND MU-Springfield, Mass. (Atlas.)
Branch: See Cars—Gasoline Pleas-

Brush Runabout Company, 61st St. and Broadway, New York City. (Brush.)

Cameron Car Co., Beverly, Mass. (Cameron.)

Carterear Co., Pontiac, Mich. (Cartercar.)

Decatur Motor Car Co., Decatur, Ind. (Decatur.) Eastern, 20 Green St.,

Branch: Eastern, 20 Green St., Boston, Mass. General Motors Truck Co., Detroit,

Mich. (G. M. C.) Branches: New York, Chicago,

Boston, Philadelphia, Kansas City. Hupp Motor Car Co., Detroit, Mich. (Hupmobile.)

See Cars-Gasoline Branches: Pleasure.

Knox Automobile Co., Springfield, Mass. (Knox.)

Mais Motor Truck Company, In-dianapolis, Ind. (Mais.) McIntyre Co., W. H., Auburn, Ind. Company, In-(McIntyre.)

Moeller, H. L., & Conn. (Moeller.) & Co., New Haven, Branch: 1123 Broadway, New York City.

Peerless Motor Car Co., The, Cleveland, O. ((Peerless.) Cars-Gasoline Branches: See Pleasure.

Pierce-Arrow Motor Car Co., Buffalo, N. Y. (Pierce-Arrow.)

Selling enault Freres Selling Branch, Broadway and 57th St., New York City (Renault.) Branches: See Cars - Gasoline Pleasure.

Reo Motor Car Co., Lansing, Mich. (Reo.)

ampson, Alden, Mfg. Co., 61st St. and Broadway, New York City. Sampson. (Sampson.)

Standard Motor Truck Co. of N. E., 9-11 Harcourt St., Boston, Mass. (McIntyre.)

Sullivan Motor Car Co., 611 East Ave., Rochester, N. Y. (Sullivan.) 611 East

United States Motor Co., Broadway and 61st St., New York City and 61st St., New York (Sampson, Brush, Stoddard).

Victor Motor Truck Co., 656 Main St., Buffalo, N. Y. (Victor.)

Willys-Overland Co., Toledo, (Overland.)

CARS-ELECTRIC COMMERCIAL.

Waverley Co., The, 172 South East Couple-Gear Freight-Wheel Co., 540 St., Indianapolis, Ind. (Waverley.) Ruchanan St., Grand Rapids, Mich. Buchanan St., Grand Rapids, Mich. (Couple-Gear.) Branches: 30th floor, Singer Bldg., New York City; 178 Devonshire St., Boston, Mass.

General Vehicle Co., Long Island City, N. Y. (G. V.)

Waverley Co., The, 172 South East St., Indianapolis, Ind. (Waverley.)

· NICIPAL SERVICE.

Atlas Motor Car Co., 104 Birnie Ave., Springfield, Mass. (Atlas.) Branch: See Cars—Gasoline Pleasure.

Cartercar Co., Pontiac, Mich. (Cartercar.)

Couple-Gear Freight-Wheel Co., 540 Buchanan St., Grand Rapids, Mich. (Couple-Gear.)

Branches: See Cars-Electric Commercial.

Knox Automobile Co., Springfield, Mass. (Knox.)

Sampson Mfg. Co., Alden, 2754 Rhode Island Ave., Detroit, Mich. (Sampson.)

United States Motor Co., Broadway and 61st St., New York City (Sampson.)

Victor Motor Truck Co., 656 Main St., Buffalo, N. Y. (Victor.)

White Co., The, 828 E. Cleveland, O. (White.) 828 E. 79th St., Branches: See Cars - Gasoline Pleasure.

Willys-Overland Co., Toledo, O. (Overland.)

CHAINS, TIRE.

tias Chain Co., 34 8 Brooklyn, N. Y. (Atlas.) Atlas Chaln 85th 8t..

McLain & Co., H. E., 165 Pond St., Natick, Mass.

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CHAINS -TRANSMISSION OR DRIVING.

Heffnung & Co., S., Ltd., 118 Broad St., New York City (Coventry.)

Miller, Chas. E., 97-108 Reade St., New York City (Brampton). Branches: See Accessory Manufac-

turers and Jobbers.

Boston Clock Co., 16 State St., Boston, Mass

Chelsea Clock Co., 16 State St., Bos- Esterline Company, Lafayette, Ind. ton, Mass.

CLUTCHES - AUTOMOBILE FRIC-TION.

Brets Co., J. S., 250 W. 54th St., New York City (Hartford cone.)

CONNECTORS AND TERMINALS.

Beck Co., The, Box 67c, Rockville Centre, N. Y.

CYLINDER CLEANING COMPOUND.

Milwaukee Auto Specialty Co., 128 Second St., Milwaukee, Wis.

Prest-O-Lite Company (Prest-O-Carbon Remover). See under Acety-lene Tank for address of main office and branches.

FUNNELS, AUTO.

Dover Stamping & Manufacturing Co., Cambridge, Mass. (Dover.)

GASOLINE MIXING DEVICES.

Royal Equipment Co., 422 Housatonic Ave., Bridgeport, Conn. (Gyrex.)

HEATERS, BRICKETTES, ETC.

Chicago Flexible Shaft Co., 132 La Salle Ave., Chicago, Ill. (Duchess and 7X Heaters; Clark Carbon Brickettes.)

HORNS—BULB, ELECTRIC, EX- K-W Ignition Co., The, 2829 Chester Ave., Cleveland, O. HAUST.

Automobile Supply Mfg. Co., 220 Taaffe place, near De Kalb Ave., Brooklyn, N. Y. (Newtone.)

Randall-Faichney Co., Boston, Mass. (Jericho.)

JACKS AND LIFTING DEVICES.

Hartford Suspension Co., 146 Bay St., Jersey City, N. J. Branches: 1700 Broadway, 212-214 W. 88th St., New York City; 325 Columbus Ave., Boston, Mass.; 1437

Vine St., Philadelphia, Penn.; 1458 Michigan Ave., Chicago, III.; 289 Halsey St., Newark, N. J.; 1524 Grand Ave., Kansas City, Mo.

LAMP COVERS.

Hopewell Brothers, Newton, Mass. (Hopewell.) Branch: 1974 Broadway, New York City

LAMPS-HEAD, TAIL AND SIDE.

Gray & Davis, 55 Lansdowne St., Boston, Mass.

CLOCKS FOR DASHBOARD, ETC. LIGHTING EQUIPMENT - ELEC-TRIC.

dison Storage Battery Co., 137 Lakeside Ave., Orange, N. J. Edison

(Matchless.) Branches: Detroit, Mich.: San Francisco, Cal.; 196 Pine St., At-lanta, Ga.: 114 Liberty St., New York City; Exchange Bldg., 53 State St., Boston, Mass.; 16 E. Main St., Waterbury, Conn.; 810 1/2 Chapel St., New Haven, Conn.

Gelssier Bros., Storage Battery Co., 514-520 W. 57th St., New York City.

Gray & Davis, 55 Lansdowne St., Boston, Mass.

K-W Ignition Co., The, 2829 Chester Ave., Cleveland, O. Sager Co., J. H., 271 South Ave., Rochester, N. Y.

MAGNETOS AND MAGNETO SUP-PLIES.

Bosch Magneto Co., 223-225 W. 46th St., New York City. Branches: 119-121 E. 24th St., Chi-

Woodward Ave., cago. Ill.: 1250 Detroit, Mich.; 357 Van Ness Ave., San Francisco, Cal.

Brets Co., J. S., 250 W. 54th St., New York City. (U. & H.) Connecticut Telephone & Electric

& Electric Britannia St., Meriden, Co., 10 Conn.

Branches: 819-A Boylston St., Boston, Mass.; 1783 Broadway, New York City; 1146 Michigan Ave., Chirancisco, Cal.; 510-511 Majestic Francisco, Cal.; 1518 Broadway, Denver, Col.; 510-511 Majestic Bldg., Detroit, Mich.; 12 So. Eighth

St., Minneapolis, Minn.

Hers & Co., 295 Lafayette St., New
York City. (Herz.)

Marburg Bros., 1777 Broadway, New

York City (Mea.)

Splitderf, C. F., Walton Avenue, and 138th St., New York City. Branches: 1679 Broadway, New York City, 1110 S. Michigan Ave., Chicago, Ill.; Motor Mart. Boston, Mass.: 430-36 Van Ness Ave., San Francisco, Cal.: 368 Woodward Ave., Detroit, Mich.; 1226 S. Olive St., Los Angeles, Cal.

MOTORCYCLES AND MOTORCY-CLE SUPPLIES.

American F. N. Co., Boston, (F. N.) Branches: 49 Union St., Providence, R. I.; 415 Trumbull St.,

Hartford, Conn. Embiem Mfg. Co., Angola, N. Y. (Emblem.)

Hendee Mig. Co., Springfield, Mass. (Indian.) Branches: 1251 Michigan Blvd., Chicago, Ill.; 234 Van Ness Ave., San Francisco, Cal.; 178 Gt. Port-

land St., London, Eng. Swensen, B. A., 298 Blackstone St., Providence, R. I. (Indian.)

MOTORING ORGANIZATIONS.

Federation American Motorcyclista, E. M. Estabrook, Bangor, Me. International Automobile Association, Sheldon M. Booth, Old South Bldg., Boston, Mass.

MOTORS AND POWER PLANTS.

Hasard Motor Mfg. Co., 122 Coates St., Rochester, N. Y. (Hazard.) Western Motor Company, Marion, Ind. (Rutenber.)

OILS. GREASES AND OTHER LUBRICANTS.

Borne, Scrymser Co., 80 Sout New York City (Colonial.) Branches: Boston, Mass.; 80 South St., River, Mass.; Philadelphia, Penn. Dixon Crucible Co., Jos., Jersey City.

N. J. (Graphite.)

Eagle Oil & Supply Co., 104 Broad St., Boston, (Eagleine No-Karbon) Fiske Bros. Refining Co., New York City. (Lubroleine.)

Branch: Pittsburg, Penn. Harris Oil Co., A. W., 326 South Water St., Providence, R. I. (Harris.)

Branch: 66 Wabash Ave., Chicago.

Haveline Oil Co., 133 William St., New York City (Havoline.) Haws, Geo. A., 77 Pine St., New York City (Panhard.)

Branch: 899 Boylston St., Boston,

Kellom cliem & Co., Chas. F., 113 Arch St., Philadelphia, Penn. (Invader.) Branch: 284 Columbus Ave., Boston, Mass.

Kincaid Oil Co., 219-221 West Exchange St., Providence, R. I. (Kincaid.)

Miller, Chas. E., 97-103 Reade St., New York City (Pan-American.) Branches: See Accessory Manufacturers and Jobbers.

New York Lubricating Oil Co., 116 Broad St., New York City. (Monogram.)

Branches: 126 Massachusetts Ave.. Boston, Mass.; 423 Passaic Ave.. East Newark, N. J.; 407 Franklin Bank Bldg., Philadelphia, Penn.: 1436 Michigan Ave., Chicago, Ill.; 1111 Superior Ave., N. W., Cleve-land, O.; 435 Turk St., San Francisco, Cal.; 618 Banning St., Los Angeles, Cal.; 177 The Vale, Acton. London, W., England; P. O. Box 619, Johannesburg, South Africa.

New York & New Jersey Lubricant Co., 165 Broadway, New York City (MoToRol, Non-Fluid, Kejex.)

CLASSIFIED BUYERS' GUIDE---Continued

Standard Oil Co., New York City (Polarine.) Branches: In all cities.

Vacuum Oil Co., Rochester, N. Y. (Mobiloil.)

Valveline 011 Co., 27 State St., Boston, Mass. (Valvoline.)

Welverine Lubricants Co., 80 Broad Hopeweii Brothers, Newton, Mass. St., New York City (Wolverine.) (Paos.) Branches: 1402 Michigan Ave., Chicago, Ill.; 224 Milk St., Boston, Mass.; 119 North Front St., Philadelphia, Penn.; 702 Candler Bldg., Atlanta, Ga.

OIL AND GREASE GUNS.

Randail-Faichney Co., Boston, Mass. (B-Line.)

PRIMING PUMPS.

Crone, F. G., 331 Genesee St., Buffalo, N. Y. (Crone.)

PUMPS - HAND AND ENGINE OPERATED.

Bridgeport Brass Co., 124 Crescent St., Bridgeport, Conn. (Atlas.)

RIMS - REMOVABLE AND TACHABLE,

Firestone Tire & Rubber Co., Akron, O.

Branches: In all principal cities. Michelin Tire Co., Milltown, N. J. Branches: Boston, Mass.; Buffalo, N. Y.; New York City; Philadel-phia, Penn.; Cleveland, O.; Chi-cago, Ill.; Detroit, Mich.; Denver, Col.; San Francisco, Cal.; Seattle, Wash,

United States Tire Co., Broadway and 58th St., New York City (Continental and Whittelsey Demontachable.)

Branches: New York, Chicago, San Francisco.

ROAD BUILDING MATERIALS.

Barrett Manufacturing Co., New Treett Manufacturing Co., New York City (Tarvia.)

Branches: Chicago, Ill.; Philadelphia, Penn.; Boston, Mass.; St. Louis, Mo.; Cleveland, O.; Pittsburg, Penn.; Cincinnati, O.; Kanburg, Penn.; Cincinnau, O., sas City, Mo.; Minneapolis, Minn.; Seattle, Wash., London, Eng.; Montreal, Toronto, Winnipeg, Vancouver, Can.; St. John, N. B.; Halifax, N. S.

SELF-STARTERS.

. E. Sales & Equipment Co., 100 Boylston St., Boston, Mass. (American.)

SHOCK ABSORBERS AND SUP-PLEMENTARY SPRINGS.

Connecticut Shock Absorber Co., 10 Britannia St., Meriden, Conn. Branches: See Magnetos

Magneto Supplies, Eartford Suspension Co., 146 Bay St., Jersey City, N. J. (Truffault-Hartford.)

Branches: See Jacks and Lifting Devices. nger Ce., J. H., 271 Sout Rochester, N. Y. (Peerless.) Snger Co., 271 South Ave.,

SOAPS.

(Paos.) Branch: 1974 Broadway, New York City.

SPARK PLUGS AND IGNITERS.

Bosch Magneto Co., 223-225 W. 46th
St., New York City.
Branches: See Magnetos and MagPerfection Spring Co., 1542 Superior
Ave., N. W., Cleveland, O.

Delta Mfg. Co., Bloomfield, N. J.

Hardy Co., R. E., 1134 Austin Ave.,
Chicago, Ill. (Sta-Rite.)

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SYSTEMS—GASOLINE
AND OIL.

Hers & Co., 295 Lafayette St., New York City (Bougle Mercedes.)

Lucas & Co., Brookline, Mass. (Sta-

Rite.) Mac-Kae Manufacturing Co., Bos. TANKS FOR FUEL AND WATER.

ton, Mass. (Mac-Kae.)

Splitdorf, C. F., Walton Ave. and lamey, Steinmets & Co., Philadel138th St., New York City.

phia, Penn. Branches: See Magnetos and Magneto Supplies.

Walker Machine Co., G. A., 83 Braintree St., Allston Station, Boston, Mass. (Ballite.)

SPARK PLUG TERMINALS.

Mac-Kae Manufacturing Co., Bos- TIMERS AND SPARK COMMUTAton, Mass. (Mac-Kae Universal.)

SPEEDOMETERS AND RECORD-ING DEVICES.

Casgrain Speedometer Co., 172 Columbus Ave., Boston, Mass. Branches: 1919 Broadway, York City; 2081 Euclid Cleveland, O. Ave.,

Speedometer, New Rochelle. Jones N. Y.

1340 Branches: Michigan Chicago, Ill.: 109 Massachusetts
Ave., Boston, Mass.: 1409 Vine St., TIRE CASINGS AND INNER TUBES.
Philadelphia, Penn.

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Warner Instrument Co., 1221 Wheeler Ave., Beloit, Wis. (Auto-Meter.) Branches: 116 Edgewood Ave., Atlanta, Ga.; 925 Boylston St., Boston, Mass.; 720 Main St., Buffalo, N. Y.; 2420 Michigan Ave., Chicago, Ill.; 807 Main St., Cincinnati, O.; 2062 Euclid Ave., Cleveland, O.; 1518 Broadway, Denver, Col.; 270 Woodward Ave., Detroit,

Mich.; 330 1/2 North Illinois St., Indianapolis, Ind.; 1613 Grand Ave., Kansas City, Mo.; 748 S. Olive Grand St., Los Angeles, Cal.; 1902 Broad-way, New York City; 302 N. Broad St., Philadelphia, Penn.; 5940 Kirkwood Ave., Pittsburg, Penn.; 14 N. Seventh St., Portland, Ore.; 36-38 Van Ness Ave., San Fran-cisco, Cal.; 611 E, Pike St., Seat-tle, Wash.; 3923 Olive St., St. Louis, Mo.

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AND OIL.

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Dover Stamping & Manufacturing Co., Cambridge, Mass.

TORS.

K-W Ignition Co., The, 2829 Chester Cleveland, O. (Master Vibrator.)

TIRE CASES.

Hopewell Brothers, Newton, Mass. (Hopewell.) Branch: 1974 Broadway, New York City

Ajax-Grieb Rubber Co., Trenton, N. J. (Ajax.) Branches: 15 Park square, Boston, Mass.; 1731 Michigan Ave., Chicago, Ill.; 905 First Ave., South, Minneapolis, Minn.; 1529 Cleveland Minneapolis, Millit., 1820 Cal.; 1038 South Main St., Los Angeles, Cal.; 544 Van Ness Ave., San Francisco, Van Ness Ave., San Francisco, Cal.; 917 East Pike St., Seattle, Wash.; 316 North Broad St., Philadelphia, Penn.; 1776 Broadway, New York City; 48 Auburn Ave., Atlanta, Ga.; 743 Woodward Ave., Detroit, Mich.; 1616 Grand Ave., Kansas City, Mo.

Consolidated Rubber Tire Co., Vesey St., New York City (Kelly-Springfield.)

Branches: Chicago, Ill.; Philadel-phia, Penn.; Boston, Mass.; St. Louis, Mo.; Detroit, Mich.; Cincin-nati, O.; San Francisco, Cal.; Los Angeles, Cal.; Akron, O.

CLASSIFIED BUYERS' GUIDE---Concluded

Empire Tire Co., Trenton, N. J. Branches: 292 Devonshire St., Boston, Mass.; 1305 Michigan Ave., Chicago, Ill.; 842 Woodward Ave., Detroit, Mich.; 264 Halsey St., Newark, N. J.; 73rd St. and Broadway, New York City; 148 Chambers St., New York City; 322 North Broad St., Philadelphia, Penn.

Firestone Tire & Rubber Co., Akron, O.

Branches: See Rims-Removable and Detachable.

Goodyear Tire & Rubber Co., Gris wold St., Akron, O. (No-Rim-Cut.)

Michelin Tire Co., Milltown, N. J. Branches: See Rims-Removable and Detachable.

Shawmut Tire Co., 97 Bedford St., Boaton, Mass.

United States Tire Co., Broadway and 58th St., New York City (Con-tinental, G & J., Hartford, Morgan & Wright.)

Branches: See Rims-Removable and Detachable.

TIRE CHAIN GRIPS.

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TIRE LOCKS.

Lucas & Co., Brookline, Mass. (B-A Branches: See Tires-Cushion. Auto.)

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rnold, N. B., 1 Sigourney St., Brooklyn, N. Y. (Slikup.) Arnold,

Michelin Tire Co., Milltown, N. J. (Mastic.)

Branches: See Rims, Removable and Detachable.

Page-Lester Co., 129 W. Van Buren St., Chicago, Ill. (Tite-Wad Rubber Putty.)

Tingley, C. O., & Co., Rahway, N. J. (C. O. T. Tire Solder)

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Selbach Rubber Co., 404 Atlantic Ave. Boston, Mass. (Selbach Safety.)

EQUIPMENT.

Mots Tire & Rubber Co., The, Ak-ron, O. (Electric Special, Mots Cushion.)

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TIRES-MOTORCYCLE.

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Branches: See Rims-Removable and Detachable.

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Ajax-Grieb Rubber Co., Trenton, N. J. (Ajax.) Branches: Inner Tubes.

Consolidated Rubber Tire Co., 20 Vesey St., New York City (Kelly-Springfield.)

Inner Tubes,

Firestone Tire & Rubber Co., Akron, O.

Branches: See Rims-Removable and Detachable.

Michelin Tire Co., Milltown, N. J. Branches: See Tire Casings and Inner Tubes.

Mots Tire & Rubber Co., The, Akron, O. (Mots.)

Republic Rubber Co., Youngstown, O. (Republic.)

United States Tire Co., Broadway and 58th St., New York City.

Branches: See Rims—Removable WINDSHIELDS AND WINDSHIELD and Detachable.

Springfield Metal Body Co., 20 Medford Ave., Springfield, Mass.

TORSION SPRINGS.

Acme Torsion Spring Co., 21 Cambria St., Boston, Mass. (Acme.)

TROUBLE FINDERS.

Hopewell Brothers, Newton, Mass. (Vibrator.) Branch: 1974 Broadway, New York City.

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neapolis, St. Paul. Pitless Auto Turntable Co., Kansas City, Mo. Portland Garage, Portland, Me.

(Portland.)

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See Tire Casings and Auto Parts Co., Motor Ave., Providence P. 7/4

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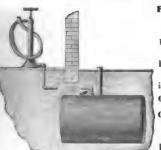
Brets Co., J. S., 250 W. 54th St., New York City (Bowden.)

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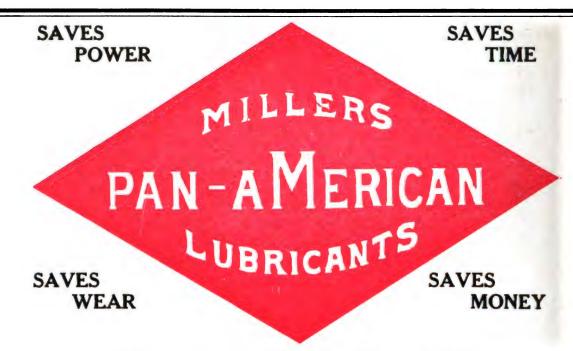
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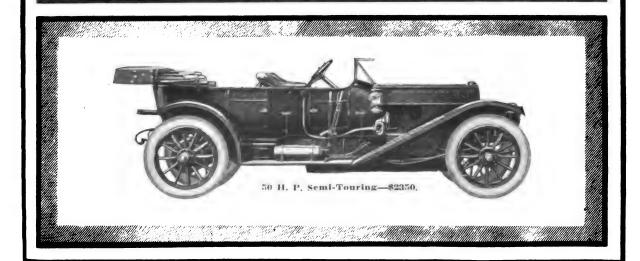


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Springfield Metal Body (g.



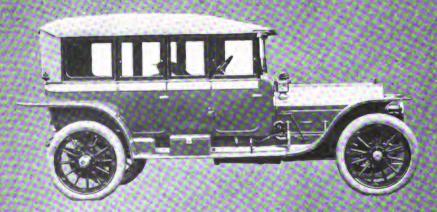
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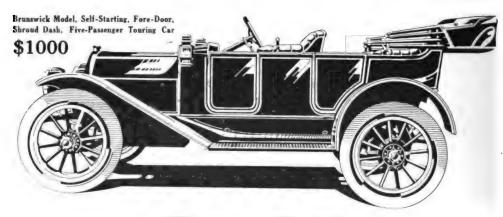
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POPULAR approval and satisfaction make the awards. The Paige is the first popular priced motor car to include a reliable self-starter as regular 1912 equipment. It is the first in its field to adopt a cork-insert multiple disc clutch. It is the first popular priced car to adopt the Delco system of ignition. For 1912 the valves are enclosed.

These new Paige refinements of construction have heretofore been found only in the high priced cars. They are refinements which will add tremendously this year to the already established popularity of the Paige.

The value of the Paige 1912 line is enhanced by the addition of the new model, the Brunswick,—a large, comfortable, 5-passenger touring car. Here is a car that the whole family may ride in. It has all the



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BEVERLY

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seat and leg room any motorist will desire for comfort. It is a touring car with more power than is actually required, even for the worst of roads or the steepest of hills.

Equipped, as are all the other six Paige models, with Delco ignition, Disco self-starter, cork-insert multiple disc clutch and enclosed valve power plant. This hand-some new model---a fore-door, shroud dash, straight-line type---sells for \$1000. At such a price there is no other value in the market to equal it.

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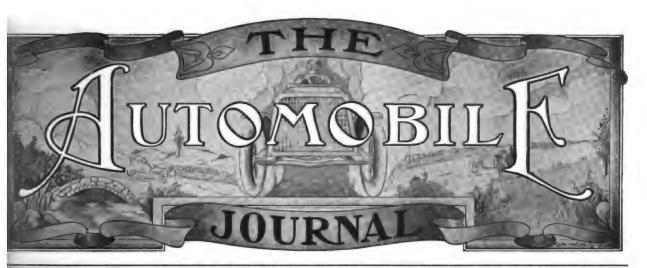
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OL. XXXII, No. 12

FEBRUARY 1, 1912

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same

conditions

prevailed at the National Associa-

tion of Automo-

bile Manufactur-

ers' show in the

new Grand Cen-

tral Palace, New York City, Jan.

10-17, under the

management of S.

A. Miles. How-

ever, there was

connection with

this display

which modifies

t h e statement

slightly. When it

ls remembered

that the exhibit

was much in the

nature of an

overflow from the

Garden, it also is

noted that sev-

eral cars on view.

both among

pleasure and

commercial vehi-

cles, were shown

for the first time

feature in

NEW GRAND CENTRAL PALACE DISPLAY.

Combined Showing of Pleasure and Commercial Lines Attracts Record Attendance-Completeness of Equipment a Feature of Offerings for Coming Season.

OW THAT the New York show season for 1912 is a matter of history, it is possible to compare results with those of former years. Insofar as pleasure cars are concerned, the relative poengineers have found little need for radical changes, while the manufacturers have given decidedly more attention to the development of such features as will tend toward comfort, reliability and economy. These

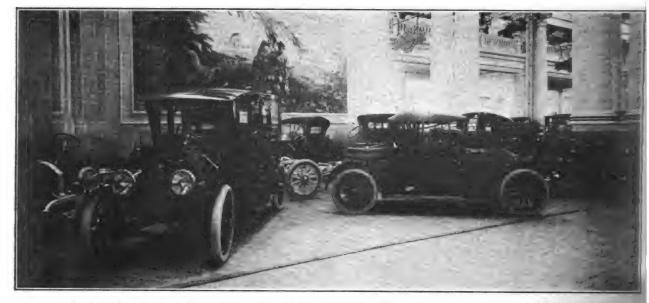
lition occupied by loreign and American makes has been entirely reversed. As was stated in the last issue of The Automobile Journal, mechanical features outweighed body design in importance at the Importers' Salon, while rich coachwork was decidedly more noticeable than radical changes in mechanical construction at the Madison Square Garden. Of course, this should not be taken to mean that the European makers failed to present splendid body

styles, or that

those who dis- Attractive Presentation of Pleasure Cars on the Main Floor of the New Grand Central Palace.

week in the Garden neglected the constructional side of their product. It simply indicates that American in the East and some of them made their initial appearance at any display. For this reason, more inter-

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Splendld Showing of Abbott-Detroit Line, Made by Abbott Motor Company, in Centre of Main Hall.

est naturally attached to their mechanical construction and in this respect the Grand Central Palace display may be said to have approached more nearly the situation which has marked the exhibitions of other years.

Confining this discussion for the time being to the pleasure cars, it must be said that practically all of the changes revealed were in the nature of refinements, and even those which were shown for the first time presented little of a radical nature, bearing in mind that the original announcement was made sufficiently well in advance of the display for the public to become more or less familiar with the details of construction. As was true at the Madison Square Garden, much attention had been paid to coachwork, and many of the cars on exhibit at the Palace vied with those at the Garden in the artistic workmanship dis-

played. It was quite noticeable that the Colonial coupe was a decided favorite among the designers, and one of these comfortable cars with its quaint, old-fashioned windows greeted the visitor at almost every turn.

The importance of the Grand Central Palace play cannot be overlooked. Unfortunately, must the exhibits were not in place when the first, or ure car, week of the Madison Square Garden was thrown open to the public the evening of J. The night was bitter cold, and the fact that so of the doors were opened continuously for the mission of new displays made the interior of the den anything but comfortable for those who present as visitors, to say nothing of the attenuate the various booths.



Display of Cole Cars in the Cole Motor Car Company's Space Was Most Complete in Every Particular.

Inasmuch as most of those who attended the openg night were New York people, it quickly became mmon news in the city that the Madison Square irden was decidedly uncomfortable. The local press its utmost to overcome this situation, but the fact mains that the attendance at the show during the st three days was anything but satisfactory.

It was evident, immediately after the opening of Grand Central Palace display, that most of those om outside the city had delayed coming to New rk until it would be possible to visit both shows at a same time. The attendance at both exhibitions as uniformly good thereafter, with Thursday as the cord breaking day in both buildings. So great was a crowd of this day that it practically was impossible to adopt any other plan than to file past the varian spaces, inspecting each in turn. The final report total attendance will show a decided increase over revious years, and a careful analysis will indicate the number of people who visited the show from utside of New York City was infinitely larger than

Prest-O-Starter, Remy electric lighting and ignition system, demountable rims, etc. A polished chassis set forth the mechanical details, which offer few changes except in matters of refinement.

Directly behind the Great Western was the McFarlan, made by the McFarlan Motor Car Company, Connersville, Ind. The new model is a self-starting six-cylinder machine, to which a number of body styles is fitted. The starter is operated by air and is the firm's own design. Control levers have been located in the centre relieving the appearance of the body exterior.

The opposite space was occupied by the Reading, made by the Middleby Auto Company, Reading, Penn. A polished chassis presented the new mechanical features, which include a larger flywheel and clutch, a double ignition system with two sets of spark plugs, and other detailed refinements.

The K-R-I-T Motor Car Company, Detroit, showed its new two-passenger roadster on the same chassis as the K-R-I-T touring car of last year. This con-



New Detachable Front Doors on Great Western Automobile Company's Product Attracted Much Favorable Comment,

ever before. Incidentally, it may be remarked that the contemplated plan of holding but one combined show next year will meet with decided approval on the part of both manufacturers and visitors.

With respect to the pleasure vehicles in the Grand Central Palace, the interior of the building is so constructed, with its massive pillars, mezzanine floor and balcony, that decorations were entirely unnecessary. Handsome paintings adorn the walls, and the only attempt at a changed appearance was the limited use of artificial foilage. There was nothing to detract the attention from the cars themselves, and a splendid opportunity was afforded to study their construction and beauty of outline.

At the right of the main entrance was the display of Great Western cars, made by the Great Western Automobile Company, Peru, Ind. These were equipped with the new detachable fore doors, which have met with such favorable reception since their announcement in the late summer. Other features include

cern will supply a self-starter and electric lighting system as extras. The standard equipment includes gas tank, luggage carrier and tire case, inside control levers and demountable rims.

The Regal Motor Car Company, Detroit, had a very comprehensive exhibit of Regal cars in the centre of the main hall directly in front of the entrance. An underslung chassis displayed the particular features of this construction which has been extended to include a touring car this season. A Colonial underslung coupe was another attraction at this space. Inside control levers add materially to the appearance of the car.

Next to this was the display of the Fiat Automobile Company, Poughkeepsie, N. Y. All of the Fiat cars shown at the Grand Central Palace were made in the American plant, and included the new six-cylinder machine, with its long stroke, en bloc motor. This is a decidedly new departure, the White and Everitt being the only other American cars employ-

ing the block form of construction for their six-cylinder engines.

Two new models of Paige-Detroit cars were shown by the Paige-Detroit Motor Car Company, Detroit, a racy type roadster and five-passenger touring. Included in the exhibit was a Colonial coupe. All models are equipped with the Disco self-starting system, Delco ignition, cork insert multiple disc clutch, enclosed valve motor, etc.

The OttoMobile Company, Philadelphia, presented the Otto line, which includes this year a large, roomy five-passenger touring model, so equipped that with two emergency seats it readily may be converted into a seven-passenger machine. The American self-starter and Remy electric lighting are standard features. The well known Otto motor is continued with such refinements as are necessary to bring it strictly up to date.

R. C. Hupp, manufacturer, Detroit, displayed the new R. C. H. for the first time at any show. This in-

The Imperial Automobile Company, Jackson Mich., had on view several Imperial cars, in which the refinement of construction has been carried out in the unit power plant with its tendency toward along stroke motor, three point suspension, full floating rear axle, multiple disc clutch, etc. The model on display were fitted with four doors, the control levers being in the centre, affording easy ingress and egress. Demountable rims are included in the standard equipment.

The Ohio Electric Car Company, Toledo, O., made its initial appearance in the East with the Ohio electric. This line is decidedly well known in the Middle West, and a determined invasion of the eastern markets is contemplated this season. Two special features were called to the attention of visitors. One of these had to do with the elimination of a universal joint by bolting the motor rigidly to the torsion tube and making the motor, torsion tube and rear axle a single unit. The other had reference to the controller,



Four New Marion Body Designs Were Marked by the Elimination of All Exterior Fittings, Including Door Handles.

cluded a complete touring roadster and white enameled chassis, both equipped with self-starters, demountable rims and one extra rim, quick detachable tires, Splitdorf dual ignition, etc. While the initial output of R. C. H. cars will include only the runabout and touring models, plans are under way for the production of a coupe and other body designs, as well as one-ton truck.

The Hupp Corporation, Detroit, presented the Hupp-Yeats electric, a white enamelled chassis setting forth the special Hupp-Yeats features in a decided manner. Chief among these were the rear axle housing, ring gear, differential and motor. Several body designs are fitted to this chassis, each with special attention to beauty of outline and elegance of finish.

The Clarke-Carter Automobile Company, Jackson, Mich., showed a full line of Cutting cars, a complete description of which will be found elsewhere in this issue of The Automobile Journal.

which is a patented type with continuous torque by means of magnets which are located on the steering post.

The Velie Motor Vehicle Company, Moline, Ill., presented a full line of Velie pleasure cars, as well as commercial vehicles. New body designs were the chief attraction, the mechanical features being largely matters of detailed refinements, inasmuch as Velic construction has been found to meet all the requirements of strenuous use under varying conditions. The 1912 equipment includes the Prest-O-Starter, electric lighting system, demountable rims, etc., and is most complete in every respect.

A new 45 horsepower Paterson five-passenger touring car was the principal feature of the exhibit made by the W. A. Paterson Company, Flint, Mich. In designing this model the aim has been to meet every requirement of power, speed and comfort. The tonneau is exceptionally roomy, being equipped with brackets for the addition of two extra seats and pro-

riding ample accommodations for seven people. The same Paterson unit construction is employed, and a self-starting device may be had as an extra.

Still another Colonial coupe was seen at the space of the Herreshoff Motor Company, Detroit, making the Herreshoff line decidedly complete and attractive. During 1912, the equipment will include all the essential features; top, windshield, electric lights, tire carriers, demountable rims, etc. The left hand control is employed, the steering levers being within the body.

A distinct feature of the exhibit made by the Penn Motor Car Company, Pittsburg, Penn., was the new racy type two-seated car, termed the Penn Comet. This is constructed throughout along lines adopted by well known racing machines and is designed to give plenty of speed and comfort. Another model was the 45 horsepower five-passenger touring car, equipped

Car Company, Detroit, is the 12-40 to which but one body will be fitted, a five-passenger fore door touring car. Other models in the line include 30 and 35 horse-power chassis to which a number of body designs are fitted. All are equipped with the Hanna self-starter, demountable rims, etc. The 12-40 has a four-cylinder block motor with bore of 4.25 inches and stroke of 4.75. The detailed specifications contain no radical changes, the construction of Warren cars having been such as to indicate that certain little refinements were all that were necessary in this respect.

The Lion Motor Car Company, Adrian, Mich., had on display a full line of Lion cars, the equipment on which is decidedly complete in every respect. Another feature of the exhibit was a collection of trophies won by cars of this make during the past year. In matters of construction, the unit power plant and full



Display of Velie Motor Vehicle Company Included Both Pleasure and Commercial Cars Offering a Wide Selection.

with Prest-O-Starter, fore doors, and control levers on the inside.

The Abbott Motor Company, Detroit, presented an entirely new design in the submarine Abbott-Detroit, a two-passenger car on the regular 44 horsepower chassis. As the name implies the design was such as to convey an impression of the submarine boat, and the color scheme was in full keeping with this idea, being battleship gray. Provision is made for the addition of two seats on the sides over the running boards, if desired. Two extra demountable rims, complete with tires, are mounted on the rear deck. All Abbott-Detroit models are fitted with electric lighting and demountable rims, and the refinement of constructional details has been most complete.

A new Warren chassis, made by the Warren Motor

floating rear axle are continued with only such changes in refinement as appeared necessary after thorough trial under every condition. The Victor self-starter, inside control levers and demountable rims are among the important items included in the equipment above mentioned.

Stutz cars were seen for the first time at any show at the booth of the Ideal Motor Car Company, Indianapolis, Ind. As is well known this is the make of machine which first appeared during the international 500-mile race on the Indianapolis speedway, Memorial Day, and was able to complete the entire distance without stop of any nature. Since that time it has made equally creditable performances in other contests of note. At the show, a Stutz chassis was displayed within a railing, an attendant going over the

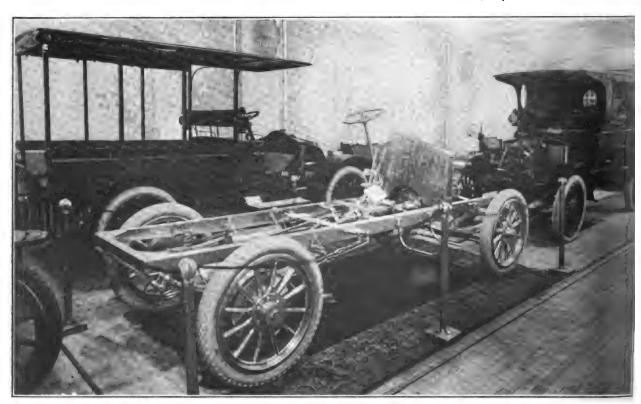
various details for the benefit of visitors. Many important features are included in the design, chief among which may be mentioned the Stutz rear system, the product of the Stutz Auto Parts Company, of which the designer is Harry C. Stutz, the same man who designed the Stutz car.

Four new Marion body designs were shown by the Marion Motor Sales Company, Indianapolis, Ind., these including the elimination of all control levers, and even the door handles from the outside of the car. Constructional details have been refined somewhat, but in the main they are the same as those which have proven satisfactory under all road conditions in the past. A self-starter is offered as standard equipment on all 1912 models.

Each year, during the New York shows, the Colt-Stratton Company, eastern distributor for Cole cars, equipment is the spare wheel attached to the rear the car, although demountable rims may be had preferred. Luggage carriers are fitted to the runniboards, and some models are supplied with electilighting. A self-starting device may be had as a extra.

Kline-Kars were shown by the Kline Motor C. Corporation, York, Penn. In these there have been but few changes in construction, the mechanical fetures having given satisfaction in service. The equiment for 1912 includes a self-starting device, d mountable rims and detachable fore doors.

A complete line of Auburn cars was seen at the space of the Auburn Automobile Company, Auburn Ind., included among which was the new 50 horse power six-cylinder model, with Rutenber motor. Combination oil and electric lights, demountable rims and



Lippard-Stewart Motor Car Company Had an Interesting Exhibit of 1500-Pound Lippard-Stewart Wagons.

made by the Cole Motor Car Company, Indianapolis, Ind., brings out a new body design, which is adopted as standard by the maker. This year, the offering was a special speedster finished in gray. This model is supplied with demountable rims and one extra rim, a luggage carrier providing for three suit cases, and provision is made for the addition of two extra seats. As is well known all Cole models for 1912 are equipped with the Prest-O-Starter and the Ward Leonard electric lighting system. The line is most complete in every detail, and the constructional features are changed mainly in the matter of refinement.

Rambler cars, made by the Thomas B. Jeffery Company, Kenosha, Wis., were shown in a number of new body designs, in which careful attention to detail was to be noted. A distinctive feature of Rambler

detachable tires are fitted to this car, which was shown as a fore door touring model with control levers within, and the exterior free from door handles or other obstructions. Other models are continued with only such changes as make for refinement of details.

De Tamble cars, made by the De Tamble Motors Company, Anderson, Ind., are offered for 1912 with self-starter, electric lights, tire carriers, demountable rims, and control levers in the centre. A change in tire size gives a width of four inches instead of 3.5, but in all other respects the constructional features are practically the same as those which have proven satisfactory during the past season.

What was claimed to be the first eight-passenger touring car ever produced was shown by the Schacht Motor Car Company, Cincinnati, O. This was a 50

epower machine with a four-cylinder motor, the as used in all the four-cylinder Schacht chassis, with a longer wheelbase to accommodate the tional seating capacity. The equipment was most plete, including the self-starting device, four doors, le control levers, etc., distinctive of all four-cylin-Schacht cars. The two-cylinder models are coned with only minor refinements.

The Michigan Buggy Company, Kalamazoo, Mich., ed special attention to the new 40 horsepower passenger touring car, with four doors and inside rol, possessing all the features which have made Michigan car a satisfactory product during the two years. The other models on the 33 and 40 sepower chassis are continued with few changes, nly matters of refinement, and the entire line offers ide selection. Body designs are quite in keeping a the constructional details in every respect.

The control on the King cars, made by the King for Car Company, Detroit, is particularly simple, sisting of one lever and two pedals. The lever is

Motor Car Company, Port Huron, Mich. The motor has a well defined long stroke, the bore being 3.75 inches and the stroke five. Cylinders are cast in pairs. Another feature is the three point suspension of the power plant, which can be removed as a whole by loosening six bolts. The body design is a fore door touring car, in which the control levers are mounted inside

The Motor Car Manufacturing Company, Indianapolis, Ind., now calls its product the Pathfinder, although it may be known better as the Parry. The motor is a four-cylinder, en bloc Continental with bore of 4.125 inches and stroke of 5.25. Other constructional details are fully in keeping with this feature. Control levers are inside, allowing of four doors on the touring car and phaeton, while the roadster and coupe are supplied with usable doors as well. Equipment includes a self-starting device and the Dyneto lighting system.

Metz friction driven cars, made by the Metz Company, Waltham, Mass., offer little change from past



Decatur Motor Car Company Presented Its Decatur Hoosier Limited Truck for the First Time in New York City,

cated in the centre of the car, the driver being seatl at the left, thus affording easy access to the front at. The three-passenger coupe is provided with elf-starter, electric lights and demountable rims, while ther models are furnished with a very complete luipment in this respect.

Stuyvesant cars, shown by the Stuyvesant Motor ar Company, Cleveland, O., offers nothing radically ew in mechanical construction. The control levers replaced in the centre, with left hand steering posion. Equipment includes self-starter, instantaneous as lighting system and other features of refinement.

The sole addition to the Bergdoll line, made by he Louis J. Bergdoll Motor Company, Philadelphia, a new 40 horsepower model, which includes a lightly heavier rear construction. This same feature has been added to the smaller cars as well. The equipment includes a Prest-O-Starter and other details which tend to make for greater comfort in operation.

A new self-starting six-cylinder Havers was the thief item of interest at the display of the Havers

seasons. The four-cylinder, en bloc motor is continued without material difference and the same constructional features are retained throughout. A chassis and runabout were on display, permitting thorough study of the friction transmission which is a feature of these cars.

The Argo Electric Vehicle Company, Saginaw, Mich., called attention to its electric pleasure vehicles, in which the patented interlocking brake and control is held to be an exclusive feature. The body designs are new, and decidedly neat and attractive.

The Standard Electric Car Company, Jackson, Mich., presented its new Standard electric pleasure cars, in which special attention was called to the narrowed front for ease of operation in crowded streets, direct line shaft drive, high power batteries, 96-inch wheelbase, simple and neat rear axle construction, large springs and beauty of outline and exterior finish in the body design.

Coming now to the matter of commercial vehicles, it is well to remark that those who showed this type



at the Grand Central Palace were unanimous in the statement that it was a great week for business. Many of those who made display for the first time were convinced that they would be able to do little more than place their product before the public, whereas they shared with the better known firms in making a large number of sales and placing agencies in many localities. As will be noted in connection with the review of the second week at the Madison Square Garden, many people evidently visited New York for the sole purpose of studying the commercial side of the industry and were prepared to do business when they saw that for which they were looking. In this respect, at least, the Grand Central Palace display of motor trucks was decided satisfactory.

Space does not permit of taking up in detail the construction of the various cars on exhibit, and while full specifications are offered elsewhere in this issue of The Automobile Journal, a more exhaustive treatment of the display will be found in the February number of our contemporary, Motor Truck. Below

automatic sealed governor and Bosch high-tension fixed ignition.

The Best, made by the Durant-Dort Carriage Company, Flint, Mich., was presented as an 800-pound chassis and delivery wagon. Here the driver is located above the motor at the left. Fixed ignition is employed, as well as a friction transmission.

The Brooks, made by the New York Auto Wagon Company, New York City, was shown as a buggy type delivery wagon and a screen sided express body. The driver is located in front with left hand control and right hand levers.

The Cass Motor Car Company, Port Huron, Mich., displayed a two-ton wide, low stake platform Cass wagon, with driver behind the motor, which is fitted with a governor and has a three point suspension.

The Chase Motor Truck Company, Syracuse, N. Y., had one of the largest exhibits in the show. This included a 1500-pound panel delivery, one-ton chassis, one-ton panel delivery, one-ton screen sided express, 1.5-ton screen sided express and two-ton flare body.



A Glimpse of the Accessory Division in Balcony, with Goodyear Tire & Rubber Company's Exhibit in Foreground.

will be given the more essential features presented at the stands:

The Argo Electric Vehicle Company, Saginaw, Mich., presented the Argo electric truck in the 1000-pound chassis and panel delivery, and one-ton low sided panel delivery. In these vehicles the driver is located in front with the battery slung amidships. The equipment includes an ampere-hour meter, securely sealed against tampering.

The Aries, made by J. Jaccard & Co., New York City, was shown as seven-ton chassis and brewery wagon. The equipment includes a governor, decompressor to assist in starting, spring on steering rod to take shock off driver's hands, and provision for easy accessibility to the motor.

The Atterbury Motor Car Company, Buffalo, N. Y., displayed a three-ton Atterbury brewery wagon, two-ton stake body and one-ton open side delivery wagon with standing top. With these vehicles the driver is located behind the motor, which is equipped with an

The 1.5-ton vehicle is a new production. Driver is located behind the motor, which is a three-cylinder, air-cooled, two-cycle unit on a sub-frame, permitting easy accessibility without disturbing seat or load.

The Commer, made in America by Wyckoff, Church & Partridge, Inc., New York City, was shown as a 4.5-ton chassis and high stake body, while an imported 6.5-ton brewery wagon also was displayed. In these the driver is located behind the motor, which offers but few minor changes over the design which has been successful for the past seven years.

The Commerce Motor Car Company, Detroit, displayed the Commerce 1000-pound chassis and panel delivery wagon. Here a friction transmission is employed, the final drive being by chain from the friction wheel to the rear axle. The driver is located behind the motor.

The Dart Manufacturing Company, Waterloo, Ia. showed the Dart 1000-pound flare board express and panel delivery wagon. In these the driver is located

SPECIAL SHOW ISSUES

February 25——March 10——March 25

BOSTON'S PLEASURE CAR GREAT POWER WAGON SHOWS

Largest Exhibitions of the Year---Attract the Buyers.

NEARLY 70,000 OWNERS IN THESE SIX STATES---LIVE, INTERESTED, BUYING USERS.

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above the motor, which is housed below the chassis, offering easy accessibility.

The Dayton Auto Truck Company, Dayton, O., presented the Durable Dayton in the 1.5-ton express wagon and a three-ton chassis. The driver is located above the motor, with left hand control and right hand levers. The engine is on a sub-frame, and the transmission on a three point suspension.

The Decatur Motor Car Company, Decatur, Ind., presented the 1.5-ton Decatur Hoosier Limited chassis and low sided box body. Here the driver is located above the motor, with right hand control and levers. On the vehicles shown, double pneumatic tires were fitted to the rear wheels, although the standard equipment is single solid.

The Eclipse Truck Company, Franklin, Penn., showed a one-ton fiare board body, three-ton screen sided express, four-ton stake body with top and side gate, and two-ton chassis. The driver is located above the block motor, which is fitted with a governor, and an air starter, although the latter was not shown.

senger hotel 'bus. The air-cooled motor has been somewhat improved over previous designs, although not in a radical manner. The driver is located partly over and partly behind the motor, with central control and right hand levers. A governor is fitted.

The Knickerbocker truck was shown for the first time at any show by the Knickerbocker Motor Truck Manufacturing Company, New York City. A five-ton chassis, three-ton screen sided brewery wagon and four-ton dumper comprised the display. The driver is located above the motor with left hand control and levers. Engine is mounted on a sub-frame and can be removed as a unit. A governor is fitted.

The Koehler is made by the L. E. Schlotterback Manufacturing Company, Newark, N. J., but the entire output is marketed by the H. J. Koehler Company, New York City. It was seen as 1600-pound panel delivery wagon, and one-ton express and panel delivery. The driver is located in front, with left hand control and right hand levers. Motor is under the chassis, which is equipped with buggy type wheels.



Where the Product of the United States Tire Company Was Displayed in the Accessory Department at the Palace.

The Federal Motor Truck Company, Detroit, displayed its one-ton Federal chassis, screen sided express and low stake platform body. The driver is located behind the motor with left hand control and levers. A governor of the centrifugal ball type is fitted.

The Gramm Motor Car Company, Lima, O., had on view a three-ton chassis, two-ton express and six-ton sand dumper. The driver is located above the motor, the cylinders of which are removable through the floor boards. The engine is located on a subframe and has three point suspension. A centrifugal ball governor is fitted.

The Hupp Corporation, Detroit, in addition to its Hupp-Yeats electric pleasure car chassis, presented a 1000-pound screen sided delivery wagon, with driver located in front at the left.

The Kelly, shown by the Kelly Motor Truck Company, Springfield, O., was seen as a one-ton chassis, three-ton express, one-ton open express and 12-pas-

The Lauth-Juergens Motor Car Company, Fremont, O., presented a one-ton flare board express wagon and three-ton high side brewery wagon with side gate near the front. In some of these cars the driver is over the motor, while in others he is partially over and partially behind. It was announced that all trucks sold in the East would be equipped with a governor.

The Lippard-Stewart Motor Car Company, Buffalo, N. Y., showed the Lippard-Stewart 1500-pound vehicle as a chassis, panel delivery and open delivery with standing top. The driver is located behind the motor, which is equipped with fixed ignition, the control being left handed with central levers.

The Maxim tricar is made by the G. H. Bushnell Press Company, Thompsonville, Conn., and is equipped with a two-cylinder vertical, air-cooled motor located over the front wheel. The capacity is approximately 500 pounds.

The Modern, made by the Bowling Green Motor Car Company, Bowling Green, O., was displayed as a



1000-pound screen express, 1500-pound chassis and 1500-pound open express. The driver is located behind the motor, with either right or left hand control.

The Motor Wagon Company of Detroit presented the 800-pound Motor Wagon in stake, panel delivery, open side, flare board with top and a chassis, and a three-seated station 'bus. The driver is located behind at the left with right hand levers. Fixed ignition is employed.

The Newark Automobile Manufacturing Company, Newark, N. J., showed the Newark as a 1000-pound chassis, 1500-pound delivery, and 1.5-ton chassis. The driver is located behind the unit power plant, with left hand control and right hand levers. Final drive is by worm and worm wheel.

The Packers Motor Truck Company, Wheeling, W. Va., exhibited a two-ton chassis and panel butcher's body. Driver is located behind the motor, which is fitted with a governor upon special order.

The Poss, made by the Poss Motor Company, Detroit, was shown as a 1000-pound chassis and panel delivery. The driver is located behind the block motor. A friction transmission is employed, final drive being by single chain to rear axle.

The Rowe Motor Company, Coatesville, Ind., displayed the Rowe for the first time at any show, the exhibit being composed of a 1500-pound vehicle with side seats and a 2500-pound high side box body with hand operated winch. The driver is located behind the motor. Worm wheel drive is offered as an option although it was not shown.

The Sanford-Herbert Company, Syracuse, N. Y., has decided to call its product the Sanford, instead of the Sanbert, it being explained that while it was the intention of the maker to combine the names of the two principal stockholders in that of the car, the public confused this with Sanford so often it was decided to make the change. The exhibit included a two-ton chassis and open flare board express body. The driver is located above the motor, which is fitted with fixed ignition.

In addition to the pleasure cars shown by the Schacht Motor Car Company, Cincinnati, O., a threeton flare board delivery wagon also was displayed. The driver is located behind the motor at the left, with right hand levers.

The Sullivan Motor Car Company, Rochester, N. Y., had on exhibit a 1000-pound flare board express wagon and a panel delivery of the same capacity. The chassis is fitted with a two-cylinder opposed, water-cooled motor, which is claimed to be very economical of oil and gasoline. The driver is located behind and at the left with right hand levers.

The Universal Motor Truck Company, Detroit, displayed a three-ton chassis and a two-ton warehouse body. In these the driver is located above the motor, and the radiator is behind the engine under the driver's seat. The whole assembly is hung on drop forged cross bars, front and rear. An automatic governor is fitted.

The Veerac, made by the Veerac Motor Company, Anoka, Minn., was shown as a 1500-pound chassis and high sided panel body with standing top. The motor is a two-cycle, two-cylinder, air-cooled unit mounted on a cross frame. Driver is located in front with left hand control and levers. Buggy type wheels and tires are fitted.

The Velie Motor Vehicle Company, Moline, Ill.,

also had on view a three-ton chassis, three-ton low stake body and 500-pound delivery wagon, in addition to the pleasure car exhibit. The driver is located behind the motor which is fitted with a governor and self-starter.

The Victor Motor Truck Company, Buffalo, N. Y., showed a two-ton Victor warehouse wagon, with driver behind the engine, and a seven-ton chassis, in which the engine is under the floor boards; in fact, all of the larger vehicles made by this concern have this arrangement of power plant. The same general mechanical features are carried throughout the entire line.

The Walker electric, made by the Walker Vehicle Company, Chicago, was displayed as a 750-pound chassis, 750-pound screen sided express and 1.5-ton panel delivery wagon. In these the driver was located on the left with left hand levers.

The Walter Motor Truck Company, New York City, called attention to the Walter 1.5, two, three, 3.5 and five-ton trucks made by it. Some of these have the driver located above and in others behind the motor, which is fitted with a governor on all models.

As has been stated, space does not permit of an extended description of any of the commercial vehicles. The same holds true of the accessories displayed at the Grand Central Palace. These occupied stands in the balcony, and ample room was afforded for this purpose. Elsewhere in this issue will be found a discussion of the new features along this line, it having been decided to combine the exhibitors in both buildings in treating upon this subject.

ENTRIES FOR INDIANAPOLIS RACE.

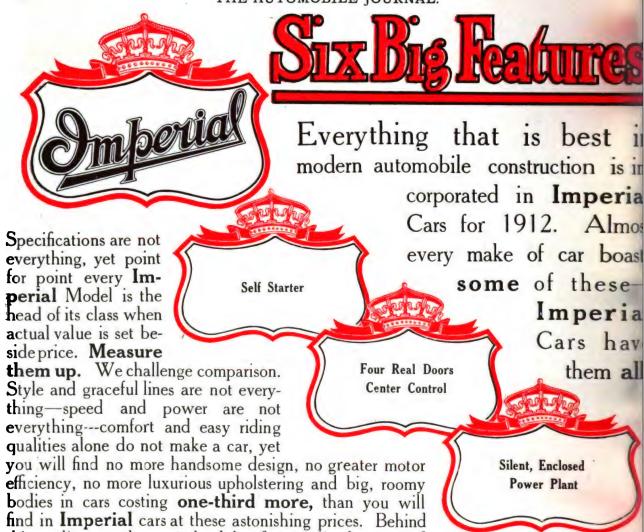
The first entries to the second annual 500-mile international sweepstakes race to be held Memorial Day at the Indianapolis Motor Speedway, were made Jan. 1 by the J. I. Case Threshing Machine Company, Racine, Wis. The two machines are to be constructed along the lines followed by European makers and will contain two new features, inasmuch as they will be fitted with wire wheels and a special left hand drive. Louis Disbrow and Joseph Jagersburger have been named as drivers.

The total number of entries is 11, the latest maker being the National Motor Vehicle Company, Indianapolis, Ind., which concern will be represented by a team of four cars piloted by Harvey Herrick, Charles Merz, Howard Wilcox and Donald Herr. Other entrants include: Two Stutz cars, by the Ideal Motor Car Company of Indianapolis; a Fiat by E. E. Hewlett of Los Angeles, Cal.; a 90 horsepower Mercedes by Ralph De Palma of New York City, and another similar machine by S. E. Wishart, Port Chester, N. Y.

PRESENT DRIVERS WITH CARS.

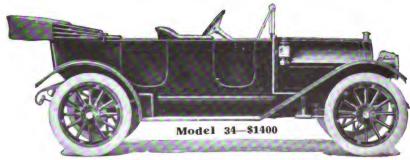
As the result of the excellent showing made by its team in the Savannah races, the Abbott Motor Company, Detroit, presented the drivers with the Abbott-Detroits they piloted in these contests. L. A. Mitchell and Carl Limberg were given the machines they drove in the Vanderbilt and Grand Prize events, and Mortimer Roberts and Harry Hartman was presented with those in which they did notable work in the Tiedeman cup race.



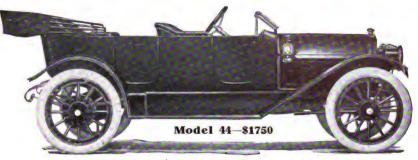


accomplishments and the wonderful victories of the Imperial cars in endurance contests. These public tests have time and time again proved the Imperial the best for reliability and dependability, when compared with a score of other cars—some cost in three times as much. Five first awards in the past five months have strengthened the record of the Imperial as the car for use,—for wear—the car for economical investment

this sterling worth, as judged by figures, lie the actual



Three Astonishing Prices



Model 44, \$1750 This 40-horsepower car has the famous Imperial, 4-cylinder, unit power plant, 4 1-2 x5 1-4 long stroke, valves enclosed. 120 inch wheel base; tires, 36 x 4; demountable rims; complete equipment, including Prest-O-Lite tank and lamp, silk mohair top, speedometer and windshield, \$1750. Self Starter, extra.

Model 34, \$1400 Imperial unit power plant, completely enclosed with 4 5-16 x5 1-4 inch motor, valves enclosed. Wheel base, 116 inches; tires, 34 x 4; demountable rims; complete equipment, including Prest-O-Lite gas tank, silk mohair top, speedometer and windshield, \$1400. Self Starter, extra.



IMPERIAL AUTOMOBILE COMPANY.

JACKSON, MICHIGAN.

Address

MOTOR TRUCKS AT GARDEN SHOW.

Decided Progress in Mechanical Construction but Few Radical Changes Noted—Body Design an Important Feature of Display---Much Business Transacted.

Compared with last year's commercial vehicle show in the Madison Square Garden, New York City, which was the first time the industrial transports had been separated from the pleasure lines, the second week's display in the same building, Jan. 15-20, under the auspices of the Automobile Board of Trade, was decidedly more complete in every particular. This applies with even greater force than with respect to the exhibitors at the Grand Central Palace, since nearly every maker represented in the former structure in 1912, also made display last year. It follows that no better opportunity ever has been had

to study the progress made in this field. In every way, the product on view was more finished, both in mechanical conand struction body work. A large majority of the better known makers were represented in this display, and most of those who may be considered as newcomers in the commercial line have had years of experience in producing pleasure cars. As a result, it is not at all strange that important progress was noted. And in this connection, it is proper to add that in most cases this improvement was not so much to

be observed in radical changes, although these were apparent in some instances, as in modifications of design to meet the expressed desires of prospective users. In fact, it may be regarded that the influence of the purchaser is to be reflected even more strongly in motor truck construction than has been the case with the pleasure car.

The importance of body work has not been overlooked. The demands of special lines of activity were recognized in many instances. This condition was even more apparent than at the Grand Central Palace. After all has been said, the display at the Madison Square Garden was a truck show purely and simply, while there was much in the other building to detract attention from this phase of the industry. The announced intention of holding but one combined ex-

hibition next year undoubtedly will meet with generous approval by all.

In the matter of attendance, it is anticipated that when the final returns are made public the figures for 1912 will show a decided increase over those of 1911. This is not at all surprising, since last year's offering was much in the nature of an experiment. Whatever story the figures will tell, it remains that those who visited the Garden during the second week were intent upon business. They represented all classes, including the farmers of up-state New York, Jersey, Pennsylvania and New England. And it was

View of Truck Display in Madison Square Garden as Seen from the Entrance to the Main Hall.

somewhat noticeable that the attendants at the various booths needed all their fund of information in order to keep abreast of many of these tillers of the soil. Chicago has boasted for a number of years that the agriculturists of the Middle West were decidedly well versed in automobile construction, as evidenced by their conduct at the annual show in that city, but the m a n u facturers who exhibit at New York now know that the farmers of the East also are well informed in this respect.

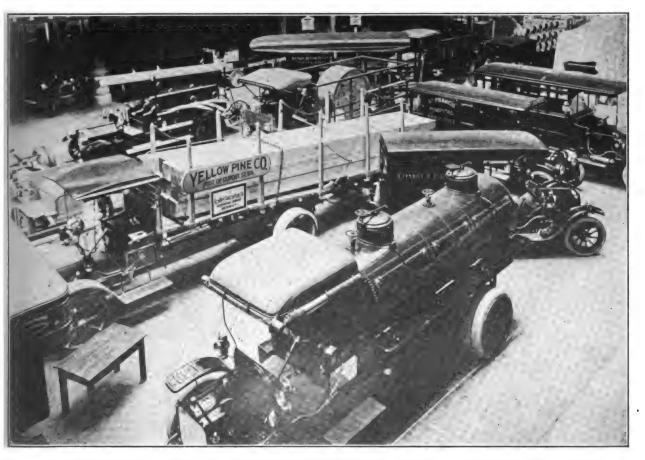
Many sales were recorded during the week, some of these being closed with large concerns operating over extensive territory; others were manufacturers, business men, merchants and contractors, and it must be added that the farmers came as well to buy as to gain information. Agencies were placed in large numbers. A consensus of opinion among the exhibitors was that the motor truck show is an established institution and that quite as much interest attaches thereto as to the pleasure car exhibit.

The only change in the arrangement of the interior, with the exception of replacing the pleasure cars by commercial vehicles, was the removal of the accessory exhibits from the basement to the balcony, and this was decidedly welcome. Because of unfortunate circumstances during the early hours of the

first week's display, the basement of the Madison Square Garden was uncomfortably cold. It was well toward the middle of the week before the visitors began to inspect the exhibits in this section as in former years. Naturally, the accessory men who had drawn space in this section, were glad of an opportunity to join their more fortunate brethren upstairs. It will be remembered in this connection, that during the commercial vehicle show of last year very little business was transacted by the accessory exhibitors, and they expected the same conditions would prevail this year. But, whether it was due to the change in location or some other cause, many of these men expressed themselves at the close of the second section as being more than satisfied with the results for the week.

over the same models for 1911, while the new sixton wagon is similar to the five. On this the driver is located beside the motor, as with the larger Hewitt, Morgan and Garford. The pumping engine has been changed slightly over that shown last year, as subsequent tests have determined the desirability. The Martin tractor has been announced in these columns, but is now offered with an attachment at the rear for connecting with the front wheels on any vehicle with which it is desired to operate the device, instead of substituting its own rear wheels for the front members of the trailing wagon.

Next to the Knox was the worm driven Pierce-Arrow, made by the Pierce-Arrow Motor Car Company, Buffalo, N. Y. This was shown as one chassis and



Comprehensive Showing of White Trucks, Made by the White Company, with Mack and Saurer Products in the Background.

The importance of the motor truck industry is such as to warrant more extended discussion than is possible in the space available in The Automobile Journal. A brief review of the various exhibits will be found herein, but it may be added that our contemporary, Motor Truck, will give somewhat more complete treatment of the subject in its February number.

Upon entering the main hall, the first space on the right was occupied by the Knox Automobile Company, Springfield, Mass., with Knox two and five-ton delivery vans, gasoline pumping fire engine, and the new six-ton truck chassis, on which was mounted a Martin tractor. The smaller vehicles show few changes two five-ton wagons, one fitted as a coal dumper and the other as a brewery wagon. Mechanically, the Pierce-Arrow truck is the same as last year, the worm drive, which appeared for the first time in America last year, being retained as having given excellent satisfaction. An interesting portion of the display was a complete worm and wheel, with the housing partially cut away to show the operation of the mechanism.

The new five-ton Locomobile truck chassis was displayed by the Locomobile Company of America, Bridgeport, Conn. It was explained that the concern does not contemplate the construction of bodies at present. The driver is located over the motor, and the



The Peerless Motor Car Company Exhibited But One Chassis, That of the Peerless Five-Ton Model.

seat tilts backward in order to provide access to the engine. Fixed ignition and governor are among the features of equipment. A Locomobile combination chemical and hose wagon also was shown, the only changes being a longer wheelbase and a little heavier rear axle.

Four Garford bodies and one chassis were offered by the Garford Company, Elyria, O., these being five-ton vehicles with the exception of a 1.5-ton public utility wagon. One body was designed for a wholesale milk business, another for a wholesale grocer and the third as a barrel wagon for breweries. In the smaller vehicle the driver is located back of the motor, while in the larger he is placed under a cab and beside the motor, which is under a hood, making it possible to obtain easy access thereto at all times. In fact, the radiator is so arranged that it may be removed and the motor slipped out the front. The principle change in construction is the substitution of a selective slid-

ing gear for the friction transmission formerly employed.

The Speedwell Motor Car Company, Dayton, O., presented a six-ton coal dumper, raised by a crank and with provision for dumping at either side or at the rear, four-ton chassis and four-ton stake body. All Speedwell trucks will be fitted with a governor. The driver is located over the engine, but the seat is so arranged that it may be tilted to one side in an ingenious manner for reaching the power plant.

The Autocar Company, Ardmore, Penn., had a large display in the rear of the hall, including a chassis, station 'bus, casket wagon, enclosed delivery, wire grill, stake, and open passenger 'bus, all on the 1.5-ton chassis. Only minor constructional changes are to be noted. The 14-seated open 'bus, with enclosed doors on the right hand side, was the chief feature of the exhibit.

Only one five-ton Stearns chassis was shown by



The Worm Driven Pierce-Arrow, Made by the Pierce-Arrow Motor Car Company, Was a Distinctive Feature of the Show.

the F. B. Stearns Company, Cleveland, O. In this the driver is located behind the motor, with left hand control and centre position of levers. This latter feature is a new departure in the Stearns products.

The General Motors Truck Company, Detroit, had one of the largest, if not the largest display in the show. G. M. C. gasoline vehicles were seen on the main floor, while G. M. C. electric cars were on the elevated platform. As is well known the gasoline trucks formerly were known as the Reliance and Rapid, while the electrics are a new design. The old Reliance was shown as a three-ton chassis, three-ton furniture van, five-ton brewery wagon and two-ton delivery; the old Rapid, as one, two and three-ton stake and grill deliveries. Few changes, except in matters of refinement, have been made in these designs.

Although the Peerless Motor Car Company, Cleveland, O., makes three and four-ton trucks, the only

City and Providence, R. I., had on display a five-ton Alco coal dumper, two-ton bottled beer wagon with side and rear entrance, and a 3.5-ton chassis. The coal truck had provision for dumping from the side, instead of at the rear, making it possible to utilize this vehicle without backing into position. The driver is located over the motor.

Unlike its pleasure car exhibit of the previous week when it had but one completed machine and a chassis, the Packard Motor Car Company, Detroit, displayed seven Packard trucks as follows: Threeton transcontinental prairie schooner, three-ton dairy wagon, three-ton beer wagon with sliding doors on either side for cases, two-ton stake body, three-ton van, three-ton gate sided body, and three-ton gas crane truck. The latter was equipped with an interloading device, similar in some respects to the lumber loading proposition fitted to a Packard truck by the Curtis & Pope Lumber Company, Boston, a dupli-



A Feature of the Knox Automobile Company's Display Was the New Knox Six-Ton Truck Carrying Martin Tractor,

one on display was a five-ton chassis, to which a large number of body designs is fitted upon order. The special features of design are the long stroke motor, four-speed selective transmission, governor, cone clutch with cork inserts, etc. The driver is located behind the motor, which is under a hood and easily accessible without disturbing either seat or load.

Perhaps the most radical change of all was to be noted in the exhibit of Grabowsky trucks, made by the Grabowsky Power Wagon Company, Detroit. Here new four-cylinder engines have replaced the two-cylinder motors of previous years. In addition the power plant is located on a sub-frame which slides from underneath the hood, and a self-starter is fitted as regular equipment. Grabowsky trucks were shown as a one-ton panel delivery, three-ton chassis, five-ton brewery wagon and three-ton furniture van, the latter being fitted up as the office for the display.

The American Locomotive Company, New York

cate of which was shown for a time early in the week.

In some respects the display of the White Company, Cleveland, O., attracted quite as much attention as any in the building, not because of any radical change in the mechanical construction, but due solely to the nature of the exhibit. The centre piece, if it may be so termed, was a large five-ton truck with trailer, on which was mounted a number of heavy timbers used in subway construction work in New York City. This combination was designed for lumber work, and when the main truck is utilized alone or with the trailer with ordinary loads, a set of rollers aids in loading and unloading. Another five-ton chassis was presented with a steel Standard Oil tank. A three-ton moving van, 1.5-ton 'bus and 1500-pound delivery wagon completed the display. The three-ton vehicle was the largest exhibited by this concern at previous shows.

The newly organized Hewitt Motor Company, New





Attractive Exhibit of Texaco Motor Lubricants, Made by Texas Company, New York City.

York City, presented a very complete line, including 3.5, 4.5, 5.5, seven and 10-ton Hewitt trucks, the latter with chassis only. The line also includes one, 1.5, and 2.5-ton vehicles, which were not shown. The two and 2.5-ton have two-cylinder opposed motors; the 3.5, 4.5 and 5.5-ton are equipped with selective transmissions, and 5.5, seven and 10-ton machines are supplied with planetary transmissions. There is practically no change in the main features of design. In some the driver is located over the motor, either at the right or left, and in others, particularly the larger vehicles, he is at the side, as previously brought out.

The International Motor Company, New York City, presented a very complete line of Mack and Saurer trucks. A self-dumping seven-ton coal wagon was kept in constant operation, the dumping feature being brought into play from the seat. An army filter was mounted on a 1.5-ton Mack chassis; a three-

ton chassis of the same make carried a telephone wiring outfit with hand operated winch; a five-ton chassis was shown with brewery body and a one-ton chassis stripped. The Saurer end of the display consisted of a 6.5-ton chassis and an imported pumping fire engine, duplicates of which will be made in the Saurer plant at Plainfield. N. J.

Another new truck was the Lozier, shown by the Lozier Motor Company, Detroit, in chassis only. This is a five-ton carrier with driver located over the motor the seat and a portion of the floor boards being allowed to tilt backward to permit reaching the power plant. The engine has a very long stroke, 4.25 by 6.5 inches, and is governed to a maximum speed of 900 revolutions a minute. This governor is a particular feature of the Lozier, operating upon the inlet manifold separate from the carburetor, where it is held to be absolutely unnecessary to break the seal for any purpose whatever.

The Alden Sampson Manufacturing Company, Detroit, presented four Sampson trucks and a chassis as follows: One thousand to 1500-pound delivery, 1.5-ton delivery, three-ton stake body and five-ton dumper. This latter is operated by compressed air from the seat, air being stored for this purpose by the engine. In all except the lower capacity wagons, the driver is located over the motor.

Two Pope-Hartford trucks were shown by the Pope Manufacturing Company, Hartford, Conn. As these vehicles have been brought out since last year's exhibits, they may be classed as new. The driver is located over the motor, the seat tipping back for access thereto. A governor is fitted. In addition to the new three-ton truck, a combination chemical and hose wagon also was displayed. This does not differ materially from those seen at previous shows.

A truck that is built around the Edison battery was the description given by the attendants at the booth of the Anderson Electric Car Company, Detroit, maker of Detroit electric vehicles. A 1.5-ton chassis, one-ton screen sided body and 1000-pound panel ex-



The Important Ball Bearing Display Arranged by the New Departure Manufacturing Company Was of Educational Interest,

press were exhibited. In view of the above description it seems sufficient to say that the mechanical details are quite in keeping with the standard set by the battery utilized.

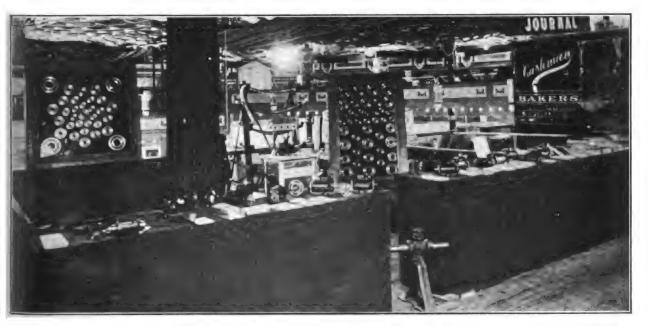
The Bronx Electric Vehicle Company, New York, City, presented the ball bearing Bronx four-ton chassis, 1000-pound chassis and 1000-pound delivery wagon. What is claimed to be an exclusive feature is the special design of hub with all ball bearings in dust tight casings running in heavy oil, by the use of which it is held to be possible to remove the wheels without getting grit into the bearings or changing their adjustment.

The Ward Motor Vehicle Company, New York City, displayed three types of Ward electric delivery wagons, of 700, 1000 and 1500 pounds capacity, respectively. This concern has been making commercial vehicles for eight years, and points to the fact that quality is its watchword, first, last and all the time. There appears to have been no decided change in mechanical details over those of previous seasons.

or lubrication is so located that it may be reached readily from outside the vehicle without disturbing the body or load.

Reference has been made previously to the G. M. C. electrics. These were displayed on the elevated platform with the other electric vehicles, the exhibit including a six-ton express, 1.5-ton delivery and threeton chassis. In addition there was an English coach, seating 12 inside, one beside the driver and four on top. Side entrances admit to the interior. As has been pointed out the design of these vehicles is new, although it is the product of John M. Lansden, who is almost too well known in the electric car field to warrant additional introduction. It follows that the constructional features have been tried out under conditions which will admit of their ready acceptance by the public.

According to the General Vehicle Company, Long Island City, N. Y., the construction of electric commercial vehicles is largely a matter of meeting the needs of the individual case. Its exhibit at the show



Marburg Bros., Inc., Made a Splendid Showing of Mea Magnetos and Other Products in the Accessory Division.

Five types of Waverley electric vehicles were exhibited by the Waverley Company, Indianapolis, Ind., as follows: One-ton delivery, 1000-pound delivery, 2500-pound chassis, three-ton chassis, and central station trouble wagon. The latter is similar to the runabout made by this company, being fitted to the same chassis, but is designed for carrying such tools and equipment as central station men would find necessary. Detailed refinements in construction are to be noted, but no radical departures from tried out features.

Three sizes of Baker electrics are offered by the Baker Motor Vehicle Company, Cleveland, O., although but two were shown. These were a 1000-pound delivery, two-ton delivery and two-ton chassis. Accessibility is one of the strong points of the Baker argument, and it is claimed that every part of the working mechanism requiring attention, adjustment

was one of the largest, including: Two-ton express, 750-pound delivery, 1000-pound delivery, 3.5-ton brewery wagon, one-ton industrial pier truck, five-ton chassis, and bottling wagon and two keg wagons of the latter capacity. All sizes are built to the same mechanical design, which has been standardized and developed to a high degree, while the bodies are adapted to the requirements of varied service.

Eight different bodies on the one-ton Buick chassis comprised the display of the Buick Motor Company, Flint, Mich. The driver is located over the motor, which is fitted with a governor to prevent undue racing. All changes are in the matter of detailed refinements.

The Lansden Company, Newark, N. J., presented its one-ton chassis, panel delivery, and provision wagon. Every effort in the design and construction of these vehicles is directed toward simplicity, reliabil-

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ity, increased mileage and carrying capacity with reduction of weight and current consumption. Edison batteries are fitted as standard.

The single-cylinder, long stroke Reo delivery wagon of 1500 pounds capacity was shown by the Reo Motor Truck Company, Lansing, Mich. In every essential feature this is the same design which was shown for the first time a year ago, and which has given such good satisfaction in service throughout the country during the past year. The driver is located over the motor, with the characteristic left hand control of all Reo cars, the levers being in the centre.

The Studebaker Corporation, South Bend, Ind., showed one 1000-pound Studebaker electric panel delivery wagon, which has been made considerably lighter, and is claimed to have at least 15 per cent. more mileage than ever before. In addition a 750-pound Flanders chassis, and delivery wagon of the same capacity were displayed. The construction of the gasoline machines does not differ materially from that of the 20 horsepower Flanders pleasure cars.

The W. H. McIntyre Company, Auburn, Ind., was particularly unfortunate, in that the McIntyre wagons shipped from the factory for display at this show, were sidetracked somewhere in West Virginia. The manager was forced to borrow three cars from customers in New York, and those on view were: Oneton delivery, 1.5-ton delivery and 1.5-ton special mattress body with extra high top. A notable change is the substitution of a four-cylinder vertical motor for the old two-cylinder opposed unit.

The Brush Runabout Company, Detroit, had on display a 700-pound Brush chassis and two panel delivery wagons of the same capacity. The motor is a single-cylinder unit with four-inch bore and five-inch stroke, located in front under a hood, with every part easily accessible.

Two models of the Cartercar, made by the Cartercar Company, Pontiac, Mich., were shown on the 1500-pound chassis. These consisted of an open grill express and a full panel delivery. The motor is a two-cylinder, opposed unit, located in front under a hood. The well known Cartercar friction transmission is employed.

Although occupying the last space on the elevated platform, the importance attached to the exhibit of the Morgan Motor Truck Company, Worcester, Mass., is none the less dimmed. A three-ton chassis, two-ton express and five-ton coal dumper comprised the display. The dumper was of particular interest, because it emptied through the side by means of an Archimedian screw. The mechanism is controlled by a pin in a chain and sprocket, the screw being operated by the motor. The driver is located beside the motor in the cab.

With respect to the accessory exhibits, a full description of the new features offered at the New York shows will be found elsewhere in this issue.

SPECIALIZED CLEANING MOTOR CARS.

Cleaning motor cars is specialized at Portland, Ore., by a concern known as the Automobile Laundry, in whose fully equipped establishment a car is washed and polished by experts in 15 minutes at a cost of \$1.50. The service appears to have "taken" admirably.

MILITIA EXPERIMENTS WITH MOTOR CAR.

Governor Osborn of Michigan has officially detailed Capt. George W. MacKay of Company A, Signal Corps, to purchase and test an automobile wireless outfit in actual service. Captain MacKay purchased a Lion, made by the Lion Motor Car Company, Adrian, Mich., and the machine carries a 50-foot cane pole in six sections, 500 feet of wire guys and aerials, a generator and two wireless operating outfits. The equipment without the pole weighs 250 pounds and in addition the automobile carries four men and a driver.

In recent tests at Port Huron the car successfully followed the movements of the detachments without respect to highways or level ground. In addition to laying wires, the car did considerable scout and messenger duty. It requires but three minutes to place the wireless in operation and the successful tests of the outfit are expected greatly to increase the efficiency of the signal corps. Capt. MacKay was the first officer to be detailed by the United States government to receive aerial instruction at the Moisant school of flying in New York.

PREDICTS GOOD BUSINESS.

President H. O. Smith of the Premier Motor Manufacturing Company, is exceedingly optimistic over the prospects of good business for 1912 and bases his forecasts upon keen observation of the commercial conditions of the country.

"It would not be reasonable to expect the increase in demand for automobiles in 1912 to equal the percentage increase of the last few years," says Mr. Smith. "When we consider that in 1909 this country absorbed twice as many as in 1908, and in 1910 four times as many as in 1908, and in 1911 slightly more than in the preceding year, it could only be pronounced a favorable outlook if we have promises of a demand equal to or slightly in excess of the best year we have had up to this time.

"Another very wholesome indication is found in the fact that a year ago almost every purchaser seemed skeptical as to the stability of the list price of the motor car. The prices did not drop, but like every other year each manufacturer has given a little more value for the money than in previous seasons. Even the most casual observer can note the great increase of the conservative element among buyers, which goes to show that the motor car is becoming universally regarded as a vehicle of conveyance solving the transportation problem as nothing else has."

DEMAND INCREASING FOR CARS.

In discussing the present condition of the motor car industry, W. E. Wright, vice president of the Knox Automobile Company, Springfield, Mass., says: "The demand for high grade automobiles will never grow less. Aside from the health and pleasure motoring affords there is a strong economic reason which always will insure a liberal use of these time savers. This lies in the fact that the daily struggle is to enlarge the sphere of human activity. The motor car enlarges this field and will be purchased in constantly growing numbers, for nothing can approach its tremendous advantage in many years."



THE FEBRUARY NUMBER OF



.... WILL CONTAIN

- Complete illustrated description of all the commercial vehicles displayed at Madison Square Garden and Grand Central Palace.
- Tabulated specifications of all the standard makes of gasoline and electric power wagons made in America.
- Advance data concerning the Coliseum Exhibition in Chicago, and list of exhibitors, with location of spaces.
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PROGRESS REVEALED IN SELF-STARTERS.

Outlining Operating Methods of Some of the Devices Now in the Market, Including Features Brought Out at New York Shows.

(Part III.)

WHILE many manufacturers of pleasure and commercial cars are fitting self-starting devices as standard equipment for 1912, there are a number who consider the situation as still in the experimental stage. This should not be taken to mean that the various appliances on the market are not practical, but with these makers there is a feeling that insufficient opportunity has been had to test them out under This applies only to those who are all conditions. not offering such devices as regular equipment, since makers of self-starting cars have subjected the appliances they have selected to very severe tests before making decision. The others are giving the matter the attention it deserves, but in the meantime

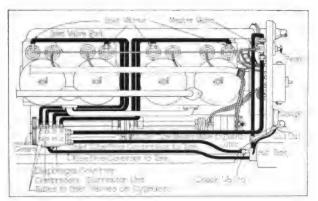


Fig. 20—Outlining Method of Installing the Start-Lite Compressed Air Device.

they occupy the position of allowing the purchaser to make his own choice.

As has been stated in a previous discussion of this subject, public demand has created the self-starter. That there is possible danger in the use of the crank is admitted, and it has been evident for some time that so soon as the user became sufficiently insistent in his desire for its elimination a way would be found to overcome the difficulty. The demand which has arisen during the past year has met a ready response from car manufacturers, and as was expected they have hastened to comply with a reasonable request. So much is this true that it is possible now to purchase practically any car with a self-starting device.

Such makers as have not made decision leave the matter of selection to the buyer. It follows that the general public is more than ordinarily interested in what may be regarded as the newest accessory. And in this connection, it is anticipated that the brief descriptions of the various devices presented in this and previous articles on the subject will prove of decided value in assisting the purchaser to reach a decision.

The Start-Lite Company, 1502 Michigan avenue,

Chicago, offers the Start-Lite starter, shown at Fig. 20, the principal feature of which is the compressor-distributor unit. It consists of a specially designed four-cylinder air compressor of large capacity with a multiple, cam operated valve distributor mounted integrally. The former is cast from a special close grained gray iron with pistons and rings of the same material accurately fitted. The crankshaft and cams are turned from one solid bar of high carbon steel and run in phosphor bronze bearings. All working parts are of bronze.

The distributor is cast from special alloy bronze. carefully machined, and all valves, connections, etc., are of the same material. The governor is of bronse bolted to and forming an integral part of the compressor-distributor unit. The master valve and foot button unit also is of bronze, tested to hold air at more than three times the pressure required for operation. The bronze cylinder inlet valves are of a specially designed poppet type and are accurately ground to seat. They are operated by the valve rod attached to the foot button and are spring retained, thereby insuring positive action. The air tank is of seamless drawn steel, tested to 600 pounds hydraulic pressure and galvanized to prevent rusting. All tubing used in connection with the installation is of annealed copper with brass unions.

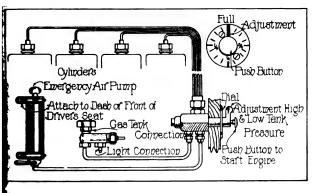
The master valve and foot button unit is mounted on the dash or foot board so that it may be operated conveniently. The cylinder inlet valves are fitted into the cylinders at some convenient opening above the pistons, usually an inlet plug. The air tank is slung under the car frame by metal straps, convenient, yet out of the way. A pressure gauge is mounted on the dash showing the exact pressure in the tank at all times. The auxiliary cut-out valve handle extends through the foot board or dash where it may be reached readily.

The auxiliary cut-out valve is In operation: opened, permitting air to flow to the master valve, but this may be done only on taking the car out for the first time each day as this valve is simply an additional precaution against possible leakage. Pressing the foot button opens the master valve and permits air to flow through the tube to the distributor, and at the same time opens the cylinder inlet valves on all cylinders. The air then passes through the distributor to the cylinders in the order of their firing. thus running the motor on compressed air until it picks up its own power, when the foot button is released, closing the master valve and cylinder inlet After this operation, the pressure on the tank is lower than normal and the compressor automatically increases it to a predetermined point.

Of course, with this system compressed air is available for inflating tires and other work. In addition, the Start-Lite Company manufacturers an aux-



iliary priming attachment, which is in no way essential to the perfect operation of the starter, but merely assists carburetion. This is connected to the start-



, 21—Thompson Acetylene Gas Starter with Emergency Air Pump,

er foot button and is operated from it.

The Andrew C. Thompson Automobile Company, Plainfield, N. J., is producing the Thompson self-starter, at Fig. 21, which is of the acetylene gas type. The principle on which it works is that of injecting a measured amount of gas into the cylinders to form the proper explosive mixture, and to ignite it by the spark in the usual manner. To provide against the possibility of insufficient air or the presence of exhaust gases in the cylinder, an emergency air pump is fitted for the purpose of supplying pure air direct to cylinders and thereby obtaining the correct mixture under all conditions.

It is claimed for this device that it is extremely simple in operation and decidedly reliable. The small push button on the dash is fitted with a valve and an efficient adjustable stop, by means of which the opening of the valve is regulated in proportion to the amount of pressure in the acetylene tank. At high pressure the valve is allowed to open but slightly, while at very low pressure it is opened wide, thereby injecting, it is claimed, exactly the same amount of gas into the cylinders in both instances. The accompanying drawing should make the working plan sufficiently understood.

Another acetylene starter is the Dual, made by the Dual Automatic Starter and Lighter Company, Monadnock block, Chicago, and illustrated at Fig. 22. The theory of this design is that of priming any four or six-cylinder engine with acetylene gas taken from the regulation tank, through the intake manifold so that the driver can start on the spark at any time. The priming is done by taking in the right amount of acetylene and air while the engine is running. The Dual simultaneously stops the engine and primes it for the next start by one quarter-turn of the starter lever to the right. A similar turn to the left lights the gas lamps.

As the engine stops the next cylinder to fire sucks in a full capacity of acetylene mixture, needing only the usual spark to cause the necessary explosion. It is claimed by the maker that the question of whether or not the mixture may be under compression has no bearing, and that it will fire equally well under either condition. The correct mixture of acetylene and air is obtained by the use of an automatic regulating

needle, and this is held to be true regardless of the storage tank pressure.

Acetylene starters are numerous. Still another is being marketed by the William M. Stacey Manufacturing Company, Springfield, Mass. This is the Perkins combined starting and lighting system, in which the principal feature is the switch located on the dash. By means of this, one lever is pulled to start the engine, another to light the headlights and a third to light the side and tail lamps.

Acetylene leaves the tank through a pressure regulator after which it is mixed with 80 per cent. of air and forced into the cylinders by a distributor. It is claimed that there is but one joint where the gas can escape and this is at the regulator. This is specially reinforced and fitted with extreme care so that even this possibility is thoroughly eliminated.

The Invincible Starter Company, Detroit, is establishing agencies for its Invincible acetylene starter, in which a small carburetor is employed for mixing the gas and air. There are but three moving parts to the device—an adjustable valve controlling the air supply, a needle valve governing the flow of gas from the tank to the starter, and a foot button at the dash for breaking the circuit and allowing the mixture to flow to the manifold.

The Blitzen self-starter, made by the Henry Manufacturing Company, 141 West 55th street, New York City, takes acetylene from the regulation tank on the last revolution of the motor and holds it in the cylinder ready for exploding whenever desired. A very small valve and two .187-inch copper pipes, one from the tank to the valve and the other from the valve to the intake or manifold, makes the device extremely simple. It is claimed by the maker that it can be attached to any car in one hour's time.

Earlier in this discussion mention was made of the carburetor gasoline starter brought out by the North East Electric Company, Rochester, N. Y. This concern also manufactures the electric starter illustrated at Fig. 23. It comprises a motor generator, starting switch, lock switch and battery, together with suitable gearing. It is entirely automatic in its operation, its chief function being to enable the driver to rotate the engine and start it by the simple opera-

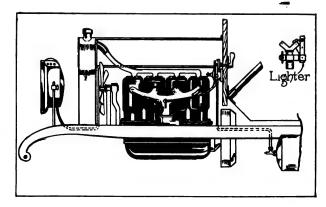


Fig. 22—Arrangement of Dual Combined Acetylene Starting and Lighting Apparatus.

tion of a starting switch located conveniently at the seat.

To start: The driver turns the ignition current

on and sets the spark and gas levers to a position, as when starting with the crank. He next moves the starting switch with the foot to the starting position

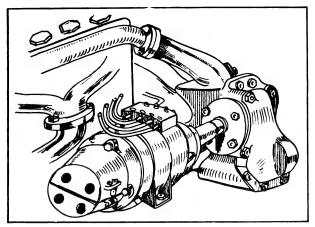


Fig. 23—Electric Generator and Connections Produced by North East Electric Company.

and holds it there. This allows current from the storage battery to flow through the motor generator and start it turning the engine, which picks up in the usual manner. After this has been accomplished the operator releases the starting switch, which automatically returns to normal position, and the motor generator supplies current for lighting, ignition or charging the battery.

Among the claims made for this system are the following: Its circuits and necessary wiring are simple, eliminating unnecessary expense and maintenance. The battery always is charged and discharged in series and never at an abnormal rate, eliminating abuse of the battery. The automatic gear arrangement is simple and reliable, and eliminates all clutches and clashing of gears, automatically giving the proper ratios between motor generator and engine both for starting and running.

The motor generator is small and compact and of a design that will lend itself to the most exacting machines, it is said. It has only one moving part, the armature, which is mounted on annular ball bearings of an approved type, and has no governors, either mechanical or electro-mechanical. The brush construction is of a special design, particularly adapted to automobile work. All coils are treated with an oil and moisture proof compound.

The Hartford Suspension Company, Jersey City, N. J., has just completed the electric starter on which it has been working for some time. This consists of a small motor which looks almost like a toy. It is only four inches in diameter and seven long. This is combined with a gear reduction of 125 to one, connected to the main shaft of the automobile, and located ordinarily between the clutch and gearbox.

The rest of the system simply consists of a small dynamo called a "Dyneto," measuring 3.5 inches in diameter and five in length. It is claimed that this will generate ample current to turn over the highest powered cars and keep all of the lights at the greatest efficiency. The motor uses very little current, only 250 watts, and it is maintained that the car engine may be turned over thousands of times without even recharging the battery.

While the Hartford company is attempting to interest manufacturers only in the starter proposition, the electric lighting portion of the equipment is being placed upon the market.

Samuel S. Eveland, Land Title building, Philadelphia, is interested in the production of the E. E. electric self-starting and lighting device. This consists of a special motor generator or dynamo which is applied in place of the usual engine flywheel. By pressing a button on the dash or other convenient place, this motor generator turns over the engine by drawing current from a storage battery, and as soon as the engine starts, current is returned to the battery again, as in other electrical systems. The device is held to be free from complicated features, and there are no bearings or other moving parts to be added to the car.

Among the cars utilizing a self-starter of the company's own design is the new six-cylinder White, made by the White Company, Cleveland, O. This is an electrical device, operating on much the same principle as the others described herein. The outfit is exceedingly simple in design, and is illustrated at Fig. 24.

The dynamo is mounted on a suitable bracket at the left side of the engine, and is connected thereto by means of a "silent" chain, which runs over a chain wheel on a shaft from the timing gear train. The remainder of the system includes an 18-volt storage battery carried in a tray below the tonneau floor, and automatic cut-out and controller lever located on the dash.

A particular feature of the whole arrangement is that the relation of the dynamo never is altered mechanically with respect to the engine, regardless of whether it is operating to charge the battery or for starting purposes. This means there are no clutches or governors between the engine and dynamo, the latter performing its function of starting directly through the timing gear train. When the engine starts, the dynamo automatically takes up its battery charging load and is automatically cut out when the engine stops.

Two other concerns, the Warner Electric Com-

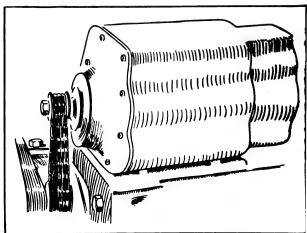


Fig. 24—Design of Electric Starter Utilised on Whit Cars and Made by the White Company.

pany, Muncie, Ind., and the Detroit Electric Appliance Company, Detroit, are working on self-starting devices. The former is not quite ready to make public



e results of its experimentation, and while the latr displayed an electric system of this nature at the adison Square Garden show in New York City, it is



ig. 25—Magnetic Valve Utilized with Invex Acetylene Device.

ot yet ready to place it on the market.

The Elder Manufacturing Company, Indianapolis, ad., is producing the Elder mechanical device, which may be described as follows: It has a motor spring hat starts the engine and so soon as this has been acomplished it is again wound by the motor. The startrise connected with the engine only at the time the atter is being started and the spring is being wound, fter which it is disconnected automatically and is eady for another start.

To operate: A pedal is depressed, thereby conlecting the starter to the engine shaft and at the same
ime releasing the spring. The gears are in a drum
in housing and run in oil, and the housing may be
ocated in front of or behind the radiator or under
the front seat, by extending the shaft that goes
through it. It is claimed that the engine crankshaft
nust turn 15 times to one turn of the drum to which
the spring is attached while winding, although it travils at crankshaft speed when the engine is being
tarted.

A device termed the Invex magnetic auto starter is made by the Webb-Veitsch Company, 1777 Broadway, New York City, and illustrated at Fig. 25. This consists of a magnetic valve placed directly on the acetylene gas tank and operated by an electric push button at the steering wheel. A .1875-inch tube connecting the Invex valve with the intake manifold completes the installation.

The method of operation is as follows: The driver presses the push button to stop the car. This action grounds the magneto or cuts out the battery and at mame instant admits current to a small iron clad magnet within the Invex valve at the tank releasing a measured quantity of acetylene to the manifold, where it is lrawn into the cylinders admixed with air as the engine turns over on its last revolution. The cylinders thus acquire an explosive charge which is retained until it is desired to start the motor, when it is ignited by throwing the switch into the starting position.

ACCESSORY MAKERS MEET.

The annual meeting of The Motor & Accessory Manufacturers held at New York City recently was unusually well attended. In his annual report, President H. T. Dunn announced that the membership had been increased to 251. The following were re-elected as members of the board of directors to serve for

three years: H. T. Dunn, Fisk Rubber Company; L. M. Wainwright, Diamond Chain & Manufacturing Company; E. S. Fretz, Light Manufacturing & Foundry Company. F. C. Billings, Billings & Spencer Company, was elected to succeed F. E. Castle. The new office of assistant treasurer also was created.

The election of officers resulted as follows: President, H. T. Dunn; first vice president, James H. Foster; second vice president, C. E. Whitney; third vice president, Claire L. Barnes; secretary and assistant treasurer, L. M. Wainwright. The following committees were appointed by the president:

Show and allotment: D. J. Post, H. E. Raymond, C. T. Byrne, James H. Foster, F. C. Billings.

Finance: James H. Foster, H. E. Raymond, C. T. Byrne, W. H. Crosby.

Traffic: D. J. Post, Claire L. Barnes, George Baum.

Membership: L. M. Wainwright, C. E. Whitney, T. J. Wetzel.

No change was made in the office of manager, William M. Sweet, who has been connected with the organization for the past five years, being continued in that position.

RADFORD TO MANAGE CARTERCAR INTERESTS.

Harry R. Radford, who for several years has held the position of general sales manager for the Carter-car Company, Pontiac, Mich., now assumes the management of all Cartercar interests, except the manufacturing department. This change follows the recent resignation of R. A. Palmer as general manager of the company. The latter was one of the original organizers, but other business interests compelled him to relinquish his position.

Although considerable speculation took place when it became known that Mr. Palmer was leaving, as to

who would succeed to the general managership President Thomas Neal of the General Motors Company, of which the Cartercar company is a part, announced that it had been decided upon to dispense with the position.

This will bring under Mr. Radford's supervision the departments of advertising, sell in g, credit of agents and the directing of the seven branches in New York City, Philadelphia, Detroit, Chicago, Kansas



Harry R. Radford, Manager Cartercar Company.

City, Los Angeles and San Francisco. The management of the factory will be under the direction of the production manager.

pany, Anderson,

Ind., well known

maker of ignition

specialties, since

Stoughton A.

Fletcher bought

the plant last February.

been appointed

general manager

of the company,

vice W. R. Po-

Mr. Griffith has

had a long ex-

perience in the m a n u facturing

business, having been connected

with the Ameri-

can Creasoting

Company of Chi-

cago before join-

ing the Remy

concern. His

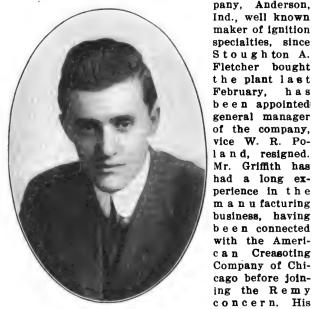
has

METZ GASOLINE ECONOMY.

Some exceptionally good results for long runs on a small amount of gasoline have been made by Metz cars, produced by the Metz Company, Waltham, Mass., according to reports furnished the concern. Dr. H. F. Curtis of Longmeadow, Mass., says he has run his Metz car over 228 miles on 10 gallons, the greater portion of the trip being over rough, hilly country. Dr. Derby of Cambridge betters this, claiming to have run his car 1505 miles at a cost of .021 cents a mile. This includes all items for repairs, the purchase of a number of small tools and remedying a leak in the radiator caused by a collision. In covering the 1505 miles Dr. Derby's car consumed 50 gallons of fuel.

GRIFFITH SECURES PROMOTION.

Harry W. Griffith of Indianapolis, Ind., who has been secretary-treasurer of the Remy Electric Com-



Harry W. Griffith, General Manager many friends in Remy Electric Company,

the automobile industry will be pleased to learn of his promotion to his new position, one which he is duly qualified to fill with success. The change became effective Jan. 18.

Mr. Poland has organized the Simplex Manufacturing Company, to produce and market a new mechanical self-starter for automobiles, and has disposed of his interest in the Remy Electric Company. Associated with him will be W. S. Poling, G. J. Derthick and James Stanley of Anderson.

CARS TO BE FULLY EQUIPPED.

President Thomas C. O'Connor of the Pullman Motor Car Company, York, Penn., believes that the time is rapidly approaching when all manufacturers will market their cars fully equipped. In speaking of this phase of selling machines, he says:

"The maker who markets his car fully equipped is not only supplying the every need of the purchaser but is aiding the agent as well. The buyer of today

is a judge of value. He knows what to expect iq the price he has decided to expend, and in many cast he is not willing to spend extra money for equipme that really belongs to him. If he cannot secure the which he desires with equipment, it may mean the he will not purchase or else the selling agent ma reduce his profit by furnishing the accessories. I be lieve that next year will see all manufacturers adop ing the full equipment plan employed by the Pullma Motor Car Company."

CONTEST BOARD ASSIGNS DATES.

At a meeting of the contest board of the America Automobile Association held at New York City r cently, the formal application for reinstatement good standing by Barney Oldfield, who is under di qualification until July 1, 1912, was considered an the request denied. H. O. Smith and the Premie Motor Manufacturing Company of Indianapolis, Ind which were disqualified because of the dispute over the Glidden tour of 1910, were reinstated.

The following tentative reservations of conte dates for 1912 were assigned: Feb. 22, road rad Bakersfield, Cal., Karn Auto Racing Association; Ma 15, 16, 17, commercial vehicle run, Chicago Mot Club; May 30, 500-mile race, Indianapolis mot speedway; June 30, Algonquin hill climb, Chicago Me tor Club; July 4, 5, 6, beach races, Old Orchard, Md Old Orchard Racing Association; Aug. 8, 9, 10, bead races, Galveston, Tex., Galveston Automobile Club Aug. 23, 24, Elgin national road race, Chicago Mote Club; Sept. 2, Indianapolis motor speedway; Oct. 5 Fairmount Park road race, Quaker City Motor Club Oct. 7-11, reliability run, Chicago Motor Club.

NEW PUBLICATION.

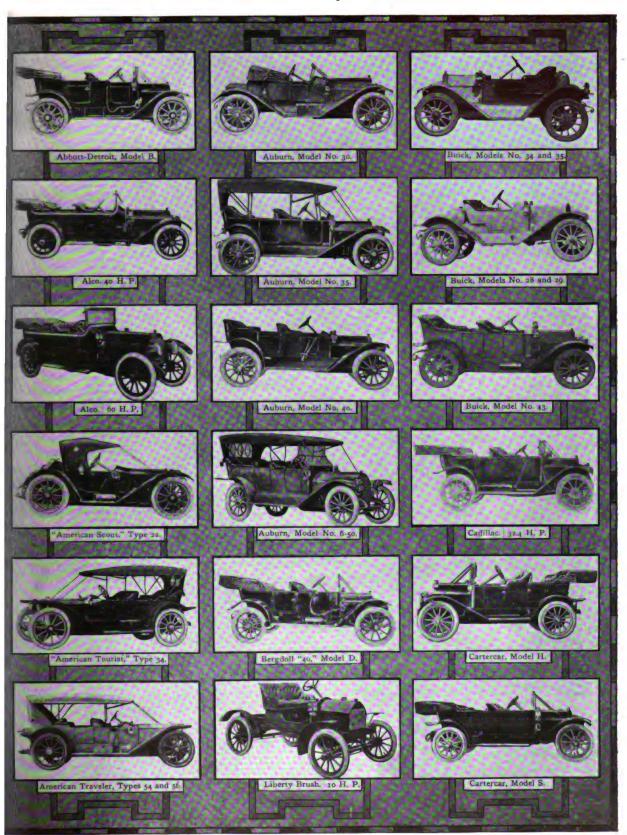
A new publication entitled "By Land and Sea" will be issued semi-monthly in New York City. Al though primarily intended for motorists the magazine will contain stories of interest to pleasure travelles in general. The book will feature touring informs tion, giving complete data of routes, hotels, custom house regulations, etc., both for this country and abroad. E. E. Schwarzkoff is publisher and editor.

INTERESTING REMY BOOK.

Homer McKee, Indianapolis, Ind., author of "Brass Tacks" has prepared for the Remy Electric Company. Anderson, Ind., an interesting little booklet entitled "A Tale of a Mirror," which is being sent to those who make application. The book is illustrated in colors, the work being by Gaar Williams, cartoonist on the Indianapolis News.

On the front cover is a mirror, above which are the words "Look Here," and below it is the question, "Would you trust this fellow's judgment on a mag-Of course, the story deals with the merits of the Remy magneto and represents an electrical expert explaining the mysteries of ignition devices to his friend, who as Mr. McKee expresses it, is simply "a greasy motorist who fights a car daily," and who is eager to learn the whys and wherefores of mag-The expert holds the mirror up to neto ignition. the Remy and tells his friend what he sees.





Tabulated Detailed Specifications of 1912

							мотон	2				
MAKE	ders ,			Cylinder	Cylinder How	Valve	CARBUR	RETION	IGN	ITION	C00	LING
	Cylinders	Bore	Stroke	Туре	Cast	Location	Design	Fuel Feed	System	Magneto	Circula- -tion	Radia- tor
Abbott-Detroit 30	4 -	4 la 4 la	4 ½ 5 ½	L. Head. L. Head	Pairs	S. & H S. & H	Stromberg Stromberg .	Gravity	Dual	Splitdorf Splitdorf	Pump	Cellular
Adams-Farwell 9*	5	5 }	5	I. Type	Sep'rate.		Own	Gravity	Dual	Splitdorf	Air	
Alco 40	4 6	51	51	T. Head T. Head.	Pairs	Opposite	Newcomb	Pressure.	Dual	Bosch	Pump	Cellular Cellular
Alpena 30	4	4 4 1	4 51	L. Head. L. Head.	Sep'rate. Sep'rate.	L. Side	Schebler	Gravity Gravity	Dual	Remy Splitdorf	Pump	Tubular Tubular
American 20 American 30 American Traveler American Traveler Spec	4 4 4	34-tenteria	4½ 5½ 5½ 5½	L. Head. T. Head. L. Head. L. Head.	En Bloc		Schebler Rayfield Rayfield Rayfield	Gravity Pressure Pressure	Single Dual Dual	Bosch Bosch Bosch	Pump	Cellular Cellular Cellular Cellular
Ames 42	4	41	51	L. Head.	En Bloc	L. Side	Schebler	Gravity	Dual	Splitdorf	Thermal	Cellular.
Anna	2	5 %	4	L. Head.	Sep'rate.	Side	Schebler	Gravity	Single	Bosch	Thermal	Tubular.
Apperson 4-45 Apperson 4-55 Apperson 4-65	4	41 51	5 5 5	T. Head. T. Head. T. Head.	Sep'rate. Sep'rate Sep'rate	Opposite Opposite Opposite	Rayfield Rayfield Own	Gravity	Dual Dual Dual	Eisemann Eisemann Bosch	Pump	Celluiar Cellular Tubular
Arbenz 40	4	41	5 1	L. Head.	En Bloe		Schebler	Gravity	Double		Pump	Tubular.
Atlas 0	4	43	41/2	2-Cycle	Pairs		Own	Gravity	Double		Pump	Cellular.
Auburn 30-L	4 4 4 6	4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4	4 51 5 51 51	L. Head. L. Head.	Sep'rate. Sep'rate	L. Side L. Side L. Side L. Side	Schebler Schebler Schebler	Gravity Gravity Gravity . Gravity.	Dual Dual Dual Double	Remy Remy Bosch	Pump Pump Pump	Tubular Tubular Tubular Tubular
Austin 45	6 6	444	51 6 7	T. Head.	Sep rate	Side Opposite In Head	Carter	Gravity. Gravity. Pressure,	Double	Optional Optional Optional	Pump Pump	Tubular. Tubular Tubular
Autocar 24-B	4	42	41/2	L. Head.	Pairs	S. & H	Stromberg	Pressure.	Double	Bosch	Pump	Tubular.
Babcock H	4 4	40 40 40	5 1 5 5 1	L. Head. L. Head. T. Head.	Pairs	L. Side R. Side Opposite	Rayfield Stromberg Rayfield	Gravity Gravity Gravity	Dual Dual Dual	Bosch	Pump Pump	Cellular Cellular Cellular
Bergdoll C	4	4	4½ 510	L. Head. L. Head.	Bloc	S. & H S. & H	Mayer	Optional Optional	Single Single	Bosch	Pump	Cellular Cellular
Berkshire E	4	411	51/	T. Head. T. Head.	Sep'rate. Sep'rate.	Opposite.	Schebler	Gravity Gravity	Dual	Bosch		Cellular. Cellular.
Brush 1912	1	4	5	L. Head.	Sep'rate.	Side	Kingston	Gravity	Single		Thermal	Tubular.
Buick 34 Buick 35 Buick 28 and 29 Buick 43	4 4 4	37 37 4 41	37 4 5	I. Type I. Type I. Type I. Type	Pairs	In Head In Head In Head In Head	Schebler Schebler Schebler	Gravity Gravity	Dual Dual Dual Dual	Splitdorf Splitdorf Splitdorf Splitdorf	Pump Pump Pump	Tubular Tubular Tubular Tubular
Cadillac 1912†	4	4 1	4 1/2	L. Head	Sep'rate.	R. Side	Own	Gravity	Double			Tubular
Cameron 28	4 4 6 0	375 to 10 3 to 3 t	33333333	I. Type	Sep rate.	In Head In Head In Head In Head		Gravity	Optional Optional Optional Optional		Air Air Air	
Carbartt J	4	418	41 51	L. Head. T. Head.	Bloc Pairs	Side Opposite.	Stromberg	Gravity		Splitdorf Bosch	Pump	Cellular.
Cartercar H	4 4	4 44 44 44	4 4 1 5 1			L. Side L. Side L. Side	Schebler Schebler	Gravity Gravity	Dual Dual Dual	Splitdorf Splitdorf Splitdorf	Pump Pump	Tubular Tubular Tubular
Case 30	4 4	41 41	5 5 1	T. Head.	Pairs	Opposite.	Optional	Gravity	Single	Remy	Pump	Cellular
Chadwick 15	6	5 5	6	L Head.	Pairs	S. & H S. & H	Own		Double	Bosch	Pump	Cellular.
Chalmers 30. Chalmers 36. Chalmers 12.	4 4 6	4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4	4554	L. Head. L. Head. L. Head.	Bloc	S. & H S. & H S. & H	Maver Rayfield Rayfield	Optional Pressure	Dual Dual	Splitdorf Bosch	Pump Pump	Cellular.
Cino 4	4 6	4 8 4	5	T. Head. T. Head.	Pairs Threes	Opposite. Opposite.	Stromberg. Stromberg.	Gravity. Gravity.	Dual	Bosch	Pump	Cellular.
Clark E	4 4 4	410	54 54 44	L. Head. L. Head. L. Head.	Pairs Pairs En Bloc.	L. Side. L. Side. On Side	Optional Optional	Gravity.	Dual Dual Dual	Remy Remy Remy	Pump Pump	Cellular Cellular Cellular

S. & H., side and head; R, right; L, left; Spl., splash; In F'l, in fuel; E. B'd, expanding band; C. B'd. contracting band; Exp., expanding; C. & D., cone and disc; D.Pl., dry plate; A. & I., asbestos and iron; A. & S. asbestos and steel; B. and S. bronze and steel; C. & B., cork and bronze; C. & S., cork and steel; F. & S.

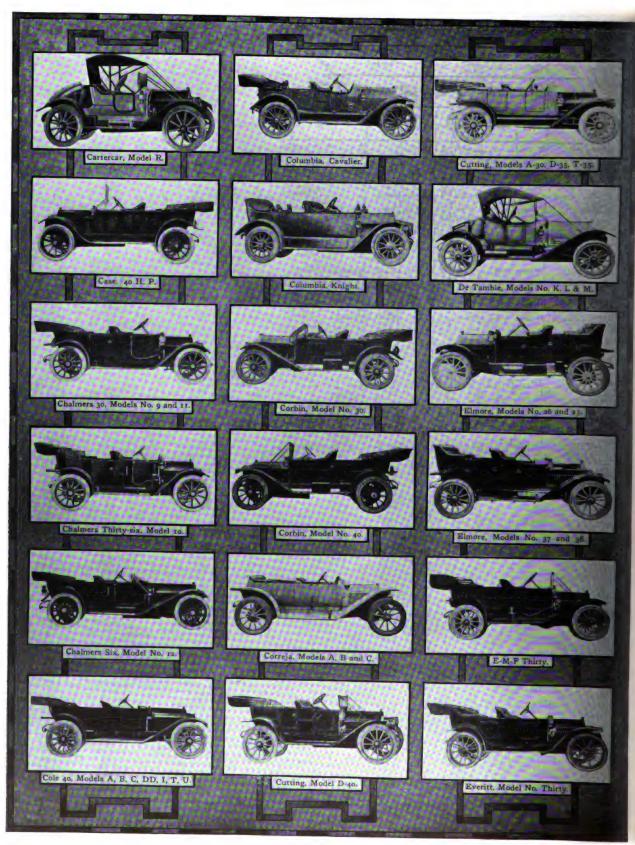


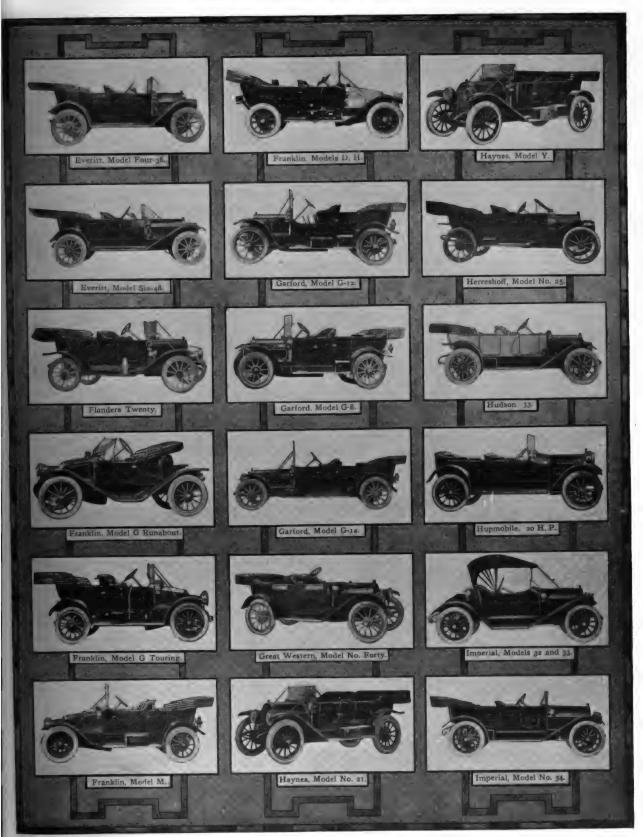
Standard Gasoline Pleasure Vehicles.

				-	TR	Ansmiss	ION					RU	INNIN	G GE	AR	
Motor Lu-	CLU	тсн	GI	EAR	SET		Car Drives	Rear	BRA	KES	98	Front	SPRI	NGS	TIF	RES
brica- tion	Type	Fric. Surf.	Туре	No.	Loca- tion	Drive	Through	Axle	Ser.	Em.	Wheelbase	Axle	Fr.	Rear	Fr.	Rear
Spl	M. Disc M. Disc	S. & R	Select. Select.	3	Amid	Shaft Shaft	T. & R. R T. & R. R	Floating	Ext Ext	Int Int	110 120	I-b'm. I-b'm.	} Ell	Ell.	34x31 36x4	34x3} 36x4
Porced	Cone	Leath'r.	Select.	3	U. Mo			Semi-float'g.		Eat	128	Round	\$ E11	1 EII		
Porced -	M.Disc M.Disc	S. & B S. & B	Select. Select.	4 4		Shaft Shaft		Floating Floating	Ext	Int Int	126 134	I-b'm.	1 Ell 1 Ell	1 Ell. 1 Ell.	36x4 36x4	36x5 36x5
Spl	Į.	Leath'r. S. & R	1	3 3	R. Ax U. Mo	Shaft Shaft	Tor. Tube Tor. Tube	Semi-float'g. Floating			112 120	l-b'm. I-b'm.	4 E11			34x34
Spl Spl Porced -	Cone Cone Cone Cone	Iron L Therm Therm Therm	Select. Select. Select. Select.	3 4 4	Amid	Shaft Shaft	Tor. Tube Tor. Tube Tor. Tube Tor. Tube	Floating Floating Floating Floating	Int	Int Int Int Int	105 118 124 140	I-b'm. I-b'm. I-b'm. I-b'm.	Ell.	EII. EII. EII. EII.	36x3½ 37x4 40x4 41x4½	37x4 41x44
Spl	M.Disc	Steel	Select.	3	U. Mo	Shaft	Springs	Floating	Int	Int	116	. I-b'm.	1 Ell	₹ E11.	36x4	36x4
Spl	1	S. & F.	1	2	Amid	1	Rad, Rd	Dead		l .	100	I-b'm.	} E11	1	'	34x3}
Spl Spl Forced	C. B'd. C. B'd. C. B'd	S. & B S. & B S. & B	Select Select Select	3 4	Amid	Shaft Shaft Shaft	Tor, Tube Springs Springs	Semi-float'g. Semi-float'g. Semi-float'g.	IExt	unt	114 118 129	I-b'm. I-b'm. I-b'm.	Ell Ell Ell	EII. EII. EII.	34×4 36×4 36×43	34×5 36×4 37×5
Spl	Cone		Select.	3	R. Ax	Shaft	Rad. Rd	Floating			120	. I-b'm.	3 E11	₹ EII.	36x4	36x4
In P'l.	1	Raybes.		3	1	ı	Springs	Floating	ł	l	128		} Ell	1	36x4	1
Spl Spl Spl	Cone Cone Cone M.Disc	L. & S L. & I L. & I T. & S	Select. Select. Select. Select.	3 3 3	Amid Amid Amid	Shaft Shaft Shaft Shaft	Rad, Rd Rad, Rd Rad, Rd Rad, Rd	Semi-float'g Floating Floating Floating	IF++	lint	112 116 120 135	I-b'm. I-b'm. I-b'm. I-b'm.		Ell. Ell. Ell. Ell.	34x31 34x31 36x4 37x41	34x34 34x34 36x4 37x44
Spl Spl Porced	M.Disc	Steel Steel S. & I	Select.	3 3 3	Amid	Shaft	Rad. Rd Rad. Rd Tor. Tube	Floating Floating Floating	Ext	Int	126 135 117	I-b'm. I-b'm. I-b'm.	E11	Ell Ell Plat	36x41 36x41 37x41	36x4 36x4 37x4
Porced .	1	Steel		4	Amid	Shaft		Floating	1	1 !	141	. [-b'm	1 -		37×5	í
Spl Spl Spl	M.Disc M.Disc M.Disc	S. & B. S. & B. S. & B.	Select. Select. Select.	3 3	Amid Amid Amid	Shaft Shaft Shaft	Springs Springs Springs	Floating Floating Floating	Int	Int	114 120 120	I-b'm. I-b'm. I-b'm.	Ell Ell Ell	EII. EII.	34x4 36x44 36x44	36x4 36x4 36x4
Spl	M.Disc M.Disc	S. & T S. & T	Select. Select.	3 4	U. Mo U. Mo	Shaft Shaft	Springs Springs	Floating Floating	Ext Ext	Ext Ext	115 115	I-b'm.	Ell	Ell.		34x31 36x4
Forced Spl	M.Disc M.Disc	Steel Steel	Select. Select.	3 4	Amid	Shaft Shaft	T. & R. R T. & R. R	Ploating	Ext	Int Int	124 134	I-b'm.	Ell	₹ E11. ₹ E11.	36x4 37x5	36x41 37x5
-Spl	M. Disc	S. & B.	Plan	2	Amid	Chain	Rad. Rd	Dead	Int		80	. Wood.		Coil	28x3	28x3
Spl Spl Spl	Cone	L. & I L. & I L. & I L. & I	Select.	3 3 3	Amid Amid Amid Amid	Shaft Shaft Shaft Shaft	Rad. Rd Rad. Rd Rad. Rd Rad. Rd	Semi-float'g. Semi-float'g Semi-float'g. Floating	Ext	lintI	91 102 108 116	Tube. Tube. I-b'm. I-b'm.	Ell.	Ell Ell Ell. Ell.	32x3 32x3 34x3 36x4	32x3 32x3 34x3 36x4
Spl	Cone	L. & S	Select.	3	i	l	Tor. Tube	Ploating	1 1	Int	116	. I-b'm.		Plat	36x4	36x4
Spl Spl Spl	Cone Cone Cone	Leath'r. Leath'r. Leath'r. Leath'r.	Select. Select. Select. Select.	3 3 3 3	R. Ax R. Ax R. Ax R. Ax	Shaft Shaft Shaft Shaft	Tor. Tube Tor. Tube Tor. Tube Tor. Tube	Floating Floating Floating Ploating	Ext Ext Ext Ext	Int Int Int Int	104 110 114 120	Tube Tube Tube Tube	E.II	E11 E11 E11 E11	32x3 32x3 34x3 34x3	32x3 32x3 34x3 34x3
Spl	Cone		Select. Select.	3	Amid	Shaft Shaft	Tor. Tube Springs	Semi-float'g. Floating	İnt	Ext	108 118	I-b'm I-b'm	Ell.	# E11.	34x3} 34x4	34x31
Spl Spl Spl			Pric Pric Pric					Ploating Ploating Ploating			102 112 122	I-b'm I-b'm I-b'm	E11 E11 E11	EII. EII. EII.	32x3 36x4 36x4	32x31
Spl	M.Disc	Steel Steel	Select. Select.	3	Amid Amid	Shaft Shaft	Rad. Rd Rad. Rd	Semi-float'g. Ploating	Int Int	Ext	116 120	I-b'm I-b'm	. ₽u	EU.	34x4 36x4	
Porced Porced		L. & I L. & I			Amid	Chain		Dead Dead			112 133	1	Ell		36x4 36x4	
Spl Spl		S. & B S. & B Steel			U. Mo U. Mo U. Mo	Shaft Shaft Shaft		Floating Floating Floating			115 115 130		Ell Ell Ell		34x00 36x00 36x4	34x00 36x00
Spl Spl	Cone	Leath'r. Leath'r.	Select. Select.		Amid Amid			Floating Floating			116 130		‡ E11		34 x4 36 x 4	34x4 36x4
		Leath'r. Leath'r. Leath'r.			R. Ax	Shaft	Tor. Tube	Semi-float'g. Semi-float'g. Semi-float'g.]	116 120 114	1	EII EII EII		34x3 34x3 34x3	

fibre and steel; F. & I., fibre and iron; Fa. & S., fabric and steel; I. & C., iron and cork; L. & I., leather and iron; L. & C., leather and cork; L. & A., leather and asbestos; R. & I., Raybestos and iron; S. & B., steel and bronze; S. & R., steel and Raybestos; S. & C., steel and cork; T. & I.. Thermoid and iron; U.Mo., unit motions







Tabulated Detailed Specifications of 1912

							мото	R	,			
MAKE	dera			Cylinder	Cylinder How	Valve	CARBUR	BTION	IGN	ITION	coo	LING
	Cylinders	Bore	Stroke	Туре	Cast	Location	Design	Fuel Feed	System	Magneto	Circula- tion	Radia- tor
Coey 1912	6	4	5	T. Head.	Threes	Opposite	Schebler	Pressure	. Dual	Bosch	Pump	Cellular.
Colby L	4 4	经	44 55 58	L. Head. L. Head. L. Head.	Bloc Pairs Pairs	R. Side L. Side Side	Stromberg Stromberg Rayfield	Gravity Gravity Gravity	Dual Dual Double	Splitdorf Eisemann Remy	Pump Pump	Tubular Tubular Tubular
Cole 1912	4	43	51	L. Head.	Pairs	L. Side	Schebler	Gravity	Dual	Bosch	Pump	Cellular.
Columbia Cavalier	4	4	51 51 41	T. Head. Sleeve L. Head.		Opposite In Sleeve.	Stromberg Stromberg	Pressure. Pressure Gravity.	Double Double	Bosch Bosch	Pump Pump	Cellular. Cellular. Cellular.
Corbin 30	4	1	1	L Head.	Sep'rate.	R. Side L. Side	Panhard Schebler	Gravity.	Double	U. & H	Pump	Cellular.
Corbin 40	4	#	5		Pairs	Opposite	Stromberg	Gravity	Double	U. & H	Pump	Cellular.
Correja A-B-C	1	4	5	T. Head. T. Head.	Pairs Pairs	Opposite Opposite	Schebler Schebler	Gravity Pressure.	Single	Simms Simms	Pump Pump	Cellular Cellular
Courier 1913	4	32	51	L. Head.	Bloc	L. Side		Gravity	Single		Thermal	Tubular.
Crawford 12-35	:	#	4 9 5 2	L. Head. L. Head. L. Head.	Bloc Pairs Pairs	L. Side L. Side R. Side	Stromberg Stromberg Stromberg	Gravity Gravity Gravity	Dual Dual Dual	Remy Remy Bosch	Pump Pump Pump	Tubular. Tubular. Tubular.
Crow-Eikhart 50 Crow-Eikhart 52	4	3 1	#	L. Head. L. Head.	Bloc	R. Side	Schebler Schebler Schebler	Gravity	Dual Single	Briggs	Thermal	Tubular. Tubular.
Crow-Eikhart 55 Crow-Eikhart 56	4	4	15	L. Head. L. Head.	Pairs Pairs	II. Side	Schebler	Gravity Gravity Gravity	Dual Single	Briggs Briggs	Thermal	Tubular. Tubular.
Crow-Eikhart 58	4	l	5	L. Head.	Pairs	R. Side	Schebler	Gravity.	1	Briggs		Tubular.
Cunningham J Cutting A-30	1	42	51	I. Type L. Head.	Pairs Bloc	Head L. Side	Stromberg, . Chapin	Gravity Gravity	Dual Double	Bosch Remy		Tubular. Cellular
Cutting T-55	4	42	51		Pairs	Opposite	Chapin	Pressure.	Double	Remy	Pump	Cellular
Dalton 6	4	3 1	41	1 1					i .	ł		Tubular.
Davis 40 Day Utility B	1	4	51	1 1		L. Side		Gravity	Dual	1		Tubular.
DeTamble K-L-M	4	41	5	i i		Side L. Side	Schebler Schebler	Gravity. Gravity.	Double Dual	1		Tubular. Cellular
Dispatch B	2	3 1 3 1	5	1 _ 1	Sep'rate.			Gravity.	Single	Simms	Air	centual .
Dispatch G-2	1	1	5	2-Cycle	Sep'rate.		Schebler	Gravity	Single	Simms	Air	
Duryea Riecta	4	4 8	5	i I		In Head		Gravity	Dual	ľ		Cellular
Duryea Runabout	2 2 2	3	3	2-Cycle 2-Cycle 2-Cycle	Sep'rate. Sep'rate. Sep'rate.		Heitger	Gravity	Single Single Single		Air Air Air	
Elmore R-26 Elmore R-27 Elmore 37	4	44	31 31 4	2-Cycle 2-Cycle 2-Cycle	Sep'rate. Sep'rate. Separate.	• • • • • • • • • • • • • • • • • • • •	Schebler Schebler Schebler	Gravity Gravity Gravity	Dual Dual Dual	K-W	Thermal Thermal Thermal	Tubular.
E-M-F A-1912	4	4	41	L. Head.	Pairs	L. Side	Own	Gravity	Dual	Splitdorf	Pump	Tubular.
Everitt 30	4 6	4 4 4	#	L. Head. L. Head. L. Head.	Bloc	L. Side L. Side L. Side	Own	Gravity Gravity Gravity	Dua	Splitdorf Splitdorf Splitdorf	Pump	Cellular Cellular, Cellular
Firestone-Columbus 86-D Firestone-Columbus 60-D Firestone-Columbus 68-D	444	##	5 1 5 5 1	L. Head. L. Head. L. Head.	Pairs	L. Side R. Side L. Side	Schebler Schebler Schebler	Gravity Gravity Gravity.	Double	Mea Mea Mea	Pump	Tubular. Tubular. Tubular.
Flanders S	4	3 3	3	L. Head: L. Head.		L. Side L. Side	Own	1	Dual	Splitdorf		Tu bular. Tub ular.
Ford T	4	31	4	L. Head.			Optional	Gravity	Single	Own	Thermal	
Four Wheel Drive A*	4	42	51	T. Head.		Opposite.	Optional			Bosch	Pumo	
Franklin G-Runabout Franklin G-Touring Franklin 25 Franklin M Franklin D	44466	3	• • • • •	I. Type	ion'rate		Own Own Own Own	Gravity. Gravity.	Dual Dual Dual	Bosch Bosch	Air Air Air	
Franklin H	6	4			1			Gravity.	Dual	Bosch	Air	
Frontenac B	1	42	5	L. Head.		R. Side	Stromberg		- 1			Cellular.
Garford G-12† Garford G-8† Garford G-14†	4 6	41	5	L. Head. I T. Head. I L. Head.	Pairs Threes	L. Side	Own Own	Gravity. Gravity. Gravity.	Dual Dual Double	Bosch Bosch	Pump Pump Pump	Cellular, Cellular, Cellular,
G. J. G. Junior	4	3 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4	4± 5	L. Head. I	Pairs	L. Side L. Side	Schebler	Gravity. Optiona	Dual	Bosch	Pump Pump	Cellular. Cellular,
Glide	4	42	5	L. Head.			Schebler	Gravity.				Cellular.

S. & H., side and head; R. right; L. left; Spl., splash; In Fl, in fuel; E. B'd, expanding band; C. B'd, contracting band; Exp., expanding; C. & D., cone and disc; D.Pl., dry plate; A. & I., asbestos and iron; A. & S., asbestos and steel; B. and S., bronze and steel; C. & B., cork and bronze; C. & S., cork and steel; F. & S.,

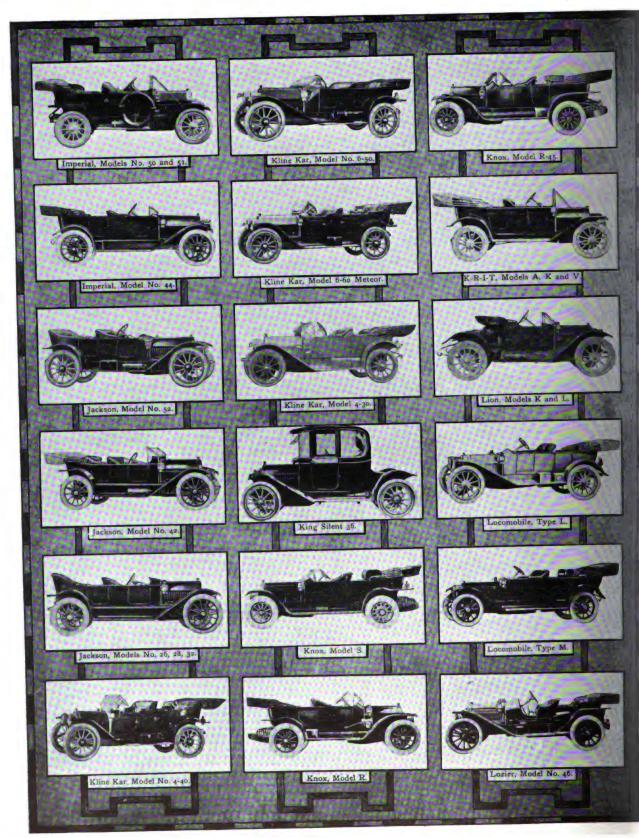


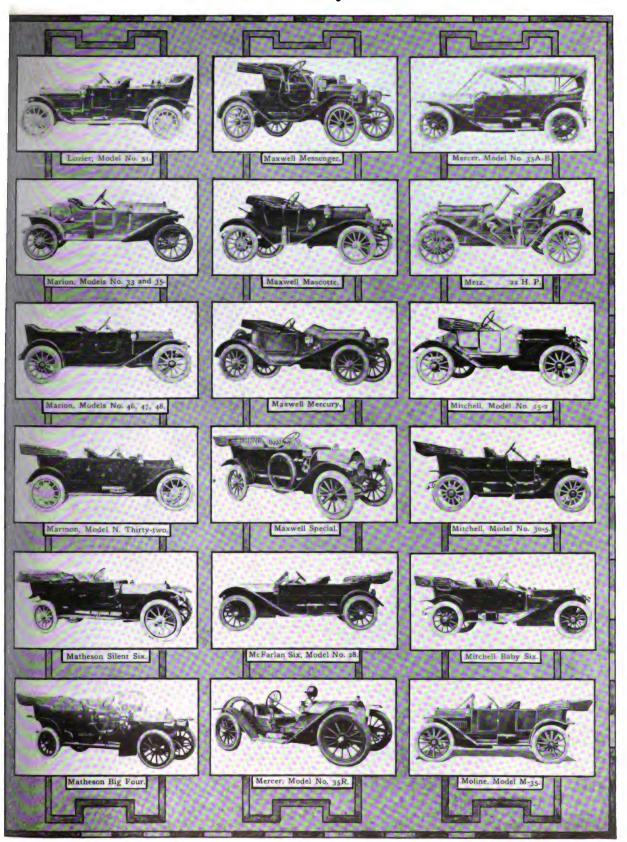
Standard Gasoline Pleasure Vehicles.—(Cont.)

					TR	ansmise	ION				İ	RU	INNIN	G GE	AR	
Motor Lu-	cro	тсн	G	BAR	SET	Drive	Car Drives	Rear	BRA	KES	3	Front	SPR	INGS	TI	RES
brica- tion	Туре	Pric. Surf.	Туре	No.	Loca- tion		Through	Axle	Ser.	Rm.	Wheelbase	Axie	Fr.	Rear	Fr	Rear
Sel	M.Disc	Steel	Select	3	R. Ax	Shaft	Tor. T	Semi-float'g.	Int		124	I-b'm	} Ell	₹ E11	36x4	36x4
Spl Spl Spl	Cone M.Disc Cone	L. & I Steel Raybes.	Select. Select. Select.	3 3 3	R. Az Amid Amid	Shaft Shaft Shaft	T.T.&R.R. T.T.&R.R.	Semi-float'g. Ploating	<u>.</u>	Int	116 121 112	I-b'm Box I-b'm	EII	EII.	36x4 36x4 32x4	36x4 36x4 32x4
Spl	Cone	L. & S	Select.	3	U. Mo	Shaft	Springs	Floating	Ext	Int	122	I-b'm		1	36x4	36x4
Spl Porced	Cone Cone	L. & I L. & I	Select. Select.	3 4	Amid Amid	Shaft Shaft	Springs Rad. Rd	Ploating Floating	Ext	Int	120 129	I-b'm I-b'm	Eli	Ell.	36x4 36x4	36x4 36x41
Porced	M. Disc	Steel	Select.	3	U. Mo	Shaft	T. T. & S	Semi-float'g.	Ext	Int	120	I-b'm	3 Eu	₹ E11	34x4	34x4
Porced Porced	Cone	L. & I L. & I	Select. Select.	3	Amid Amid	Shaft Shaft	Springs Springs	Semi-float'g. Ploating	Int Int	Ext	115 120	I-b'm I-b'm	En	Ell.	34×4 36×4	34×4 36×4
Porced Porced	Cone	L. & S L. & S	Select.		R. Ax R. Ax	Shaft Shaft	T.T.& R.R. T.T.& R.R.	Semi-float'g. Semi-float'g.	Ext	Ext	105 125	I-b'm I-b'm	E11	Eu.	34x31 36x4	34x31 36x4
	l	S. & B	1	3	1	1	Springs		1	l.	108	I-b'm			1	28x31
Spl Spl Spl	Cone Cone Cone	Leath'r. Leath'r. Leath'r.	Select. Select. Select.	3 3 3	R. Ax R. Ax R. Ax	Shaft Shaft Shaft	Tor. Tube Tor. Tube Tor. Tube	Ploating Ploating Ploating	Ext Ext Ext	Int Int Int	115 120 123	I-b'm I-b'm I-b'm	1 Ell 2 Ell 2 Ell	EII EII EII	34x33 34x4 34x4	34×4 34×4 34×4
Spl	M. Disc M. Disc	Steel Steel	Select. Select.								110 113					32x3 32x3
Spl Spl Spl	M.Disc M.Disc M.Dise	Steel Steel Steel Steel Steel	Select. Select. Select.	3 3	R. Ax R. Ax R. Ax	Shaft Shaft Shaft	T.T.&R.R. Rad. Rd Rad. Rd	Semi-float'g. Semi-float'g. Semi-float'g. Ploating Ploating	Ext Ext Int	Int Int Ext	116 122 122	I-b'm I-b'm I-b'm I-b'm I-b'm	EII EII EII	EII EII.	34x34 37x44 36x4	34x34 37x44
	í	L. & C.	1		l	1	l .	Floating	1	t	124	I-b'm		1	1 .	00x41
Forced Porced	M. Disc M. Disc	C. I	Select. Select.	3	Amid Amid	Shaft Shaft	Rad. Rd T.T.&R.R.	Semi-float'g. Ploating	Ext Ext	Int	116 116	I-b'm I-b'm	} E11 } E11	En.	34×4 36×4	34x4 36x4
Spl.	Cone	L. & I	Select.	. 3	R. Ax	Shaft	Springs	Semi-float'g.	Int	Int	106	I-b'm	₫ EII	₹ E11	32x3}	32x3½
Spl	1	Leath'r.	l .	3	Amid	Shaft	Rad. Rd	Ploating	ļ		112	I-b'm	j	? Plat	36x4	36x4
Spl	1	S. & B.		. 3	U. Mo			Semi-float'g.	1		110	I-b'm	1	1		32x31
Spl In P'l	M. Disc	S. & B	Pric	3	U. Mo	1	l	Floating		1	116 96	I-b'm	-	ı	34x4 36x3	36x3
In P'1 Spl	M Disc	S. & R.	Fric	1	l	1	ı	Dead Dead Ploating	ì	i	120 115	Tube Tube I-b'm	ı	l	36x3}	36x3 36x4
In Fil			Pric	2	l			1	1	1	80				1	
In P'i In P'i			Fric	2				Dead Dead Dead			100	Channel Channel Channel				
Spl Spl Spl	E.B'd. E.B'd. E.B'd.	P. & S P. & S P. & S	Select. Select. Select.	3 3	Amid Amid Amid	Shaft Shaft Shaft	Tor. Tube Tor. Tube Tor. Tube	Semi-ficat'g. Semi-float's. Semi-float's.	Ext Ext Ext	Int Int Int	1081 1081 114	I-b'm I-b.m I-b'm	Ell:. Ell:. Ell:.	Ell Ell. Ell.	32x3 32x3 34x4	32x31 32x31 34x4
Spl	1	L. & I.	1	1				Semi-float'g.			112		≩ E11		32x3}	32x34
Spl Spl Spl	Cone Cone Cone	L. & S L. & S L. & S	Select. Select. Select.	3 3	R. Ax R. Ax R. Ax	Shaft Shaft Shaft	Tor, Tube Tor, Tube Tor, Tube	Semi-float'g Semi-float'g Semi-float'g			110 115 127	I-b'm I-b'm I-b'm	E11 E11 E11	EII EII EII	34x3} 34x4 36x4	34x4
Spl Spl	Cone Cone Cone	P. & I P. & I P. & I	Select. Select. Select.	3 3 3	Amid Amid Amid	Shaft Shaft Shaft	R. R. & S Tor. Tube R. R. & S	Floating Floating Floating	Int Ext Int	Int Int Int	116 121 121	I-b'm I-b'm I-b'm	Ell Ell Ell	E11. E11. E11.	34×4 36×4 36×4	34x4 36x4 36x43
Spl Spl	Cone Cone	Leath'r. Leath'r.	Select. Select		R. Ax	Shaft	Tor. Tube.	Semi-float'g. Semi-float'g.	Ext	[nt		I-b'm I-b'm				
Spl	M.Disc	Steel	Plan	2	U. Mo	Shaft	Tor. Tube	Semi-float'g.			100	I-b'm	Cross	Cross.	30x3	30x3}
	M.Disc		Select.					Floating			134	Ploat'g	₹ E11		36x41	
Porce Porce	M.Disc M.Disc	S. & B S. & B S. & B S. & B S. & B	Select.	3	Amid Amid	Shaft Shaft	Springs Springs	Semi-float'g. Semi-float'g.	Tran. Tran	Ext	100 103	Tube	E11	Ell	32x3≟ 32x4	32x4 32x4
Porce Porce	M.Disc M.Disc	S. & B S. & B	Select.	3	Amid	Shaft	Springs	Semi-float'g. Semi-float'g.	Tran. Tran.	Ext	108 116	Tube	Ell	Ell	34×4 .	34×44 34×44
				3	Amid	Shaft	Springs	Semi-float'g. Semi-float'g. Semi-float'g. Semi-float'g. Semi-float'g. Semi-float'g.	Tran.	Ext	123 126	Tube Tube	EII	Ēii	32x32 32x4 34x4 34x4 36x43 36x43	37x5
		L. & C		3		1 .		Floating	i				₽ E11	- 1	34×4	_
Spl Spl Spl	Cone Cone Cone	L. & C L. & C L. & C	Select. Select. Select.	4 4	Amid Amid	Shaft Shaft Shaft	Rad. Rd Rad. Rd Rad. Rd	Floating Floating Floating	Ext Ext Ext	Int Int Int	119 119 138	I-b'm,. I-b'm I-b'm	Ell Ell	Plat Plat Plat	34x4 36x4 36x4	4x4± 6x4± 7x5
		Steel Leath'r.		1 .				Semi-float'g. Floating				I-b'm I-b'm			- 1	
Spl.	M,Disc	Steel	Select.	3	R. Ax	Shaft	Tor. Tube.	Semi-float'g.	Ext	Int.	120	I-b'm	E11	E11.	6x41 3	6x4 }

fibre and steel; F. & I., fibre and iron; Fa. & S., fabric and steel; I. & C., iron and cork; L. & I., leather and iron; L. & C., leather and cork; L. & A., leather and asbestos; R. & I., Raybestos and iron; S. & B., steel and bronze; S. & R., steel and Raybestos; S. & C., steel and cork; T. & I.. Thermoid and iron; U.Mo., unit motion.







Tabulated Detailed Specifications of 1912

							мото	R				
MAKE	dera			Cylinder	Cylinder How	Valve	CARBUR	BTION	IGNT	TION	C001	LING
	Cylindera	Bore	Stroke	Туре	Cast	Location	Design	Fuel Food	System	Magneto	Circula- tion	Radia- tor
Great Eagle 4-50	4 6	41	5 51	L. Head. L. Head.	Sep'rate. Sep'rate.	L. Side L. Side	Stromberg Stromberg	Gravity.,	Dual Dual	Remy	Pump Pump	Cellular Cellular
Great Southern 30 Great Southern 50	4	4 5	4½ 6	L. Head. L. Head.	Bloc Pairs	R. Side R. Side	Schebler Stromberg	Gravity Gravity.	Dual Double	Bosch	Thermal Pump	Cellular Cellular
Great Western 40 Great Western 40	4	#	5	L. Head. L. Head.	Sep'rate. Sep'rate.	S. & H S. & H	Schebler Schebler	Gravity Gravity	Dual Dual	Remy	Pump Pump	Tubular Tubular
Grout 35	4	#	5	L. Head. L. Head.			Schebler Schroler		Dual Dual	Bosch Optional	Pump	Tubular
Hailaday 30 Hailaday 40 Hailaday 50	1	31 41 41	51 5 5	L. Head. L. Head. L. Head.			Schebler Schebler Schebler		Dual Double Double	Splitdorf	Pump	Cellular
Haynes 20 Haynes 21 Haynes Y	4 4	4 1 4 2 5	5 5 5	T. Head. T. Head. T. Head.	Pairs Pairs Pairs		Stromberg Stromberg Stromberg		Dual Dual Dual	Eisemann Eisemann Bosch	Pump Pump Pump	Cellular. Cellular. Cellular.
Havers 6-44	6	3 1 4	5	L. Head. L. Head.	Pairs Bloc		Stromberg Schebler		Dual	Bosch Splitdorf	1	1
Henry W		41	51	L. Head.	Bioc	D. Side	Rayneld	Gravity	Dual	Splitdorf	Pump	Tubular
Herreshoff 25. Herreshoff 25-Touring		3	31	L. Head. L. Head.		L. Side	Stromberg Stromberg		Single Single	i i	Thermal Thermal	Tubular
Hudson Roadster Hudson Touring	4	1	1	L. Head. L. Head.	Bloc	L. Side	Stromberg Stromberg	Pressure. Gravity	Dual Dual	Bosch	Pump Pump	Tubular
Hupmobile Runabout Hupmobile Touring	ı	31	3 i	L. Head. L. Head.			Breeze Breeze		Single Single	Bosch	Thermal Thermal	Tubular Tubular
Illinois 1912	ı	41	47	L. Head.	Pairs	L. Side	Schebler	Pressure.	Double	Remy		
Imperial 34. Imperial 44. Imperial 50-51.	4	*	5	L. Head. L. Head. L. Head.	Pairs Pairs Pairs	L. Side L. Side L. Side	Schebler Schebler Schebler Optional	Gravity Gravity Gravity Gravity	Dual Dual Dual	Remy Remy Remy	Thermal Thermal Thermal	Tubular Tubular
Inter-State 30-AInter-State 40*Inter-State 50	4	41 42 5	5 5 6	L. Head. L. Head. T. Head.	Pairs En bloc Pairs	L. Side L. Side Opposite	Special Special Special	Gravity Pressure. Pressure.	Double Double Double	U. & H U. & H U. & H	Pump Pump Pump	Cellular. Cellular. Cellular.
Jackson 26-28 Jackson 32 Jackson 42 Jackson 52	4 4 4	4	41	L. Head. L. Head. I. Type I. Type	Pairs Pairs Pairs Pairs	L. Side L. Side Head In Head	Schebler Schebler Schebler Schebler	Gravity Gravity Gravity Gravity	Dual Dual Dual Dual	Splitdorf Kingston Kingston Kingston	Thermal Thermal Thermal Thermal	Cellular. Cellular. Cellular. Cellular.
Jenkins 50	4	41	51	T. Head.		Opposite .			Dual	Bosch		
Johnson A Johnson B Johnson C	4.	41 5	5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5				Stromberg Stromberg Stromberg			Splitdorf Bosch Bosch	Pump Pump Pump	Cellular. Cellular. Cellular.
Jonz B. Jonz B (Air-cooled) Jonz D.	4	31	41 51				Own Own Schebler		Dual Dual Dual	Bosch	Thermal Air Punip	
Kenmore D		3 ii	31 51				Optional Special		Single Dual	Bo ch Bosch	i .	i
Kisselkar 30. Kisselkar 40. Kisselkar 50. Kisselkar 60.	L	41444444	41 41 5 41				Stromberg.: Stromberg Stromberg Stromberg				1	1
Klinekar 4-30 Klinekar 4-40 Klinekar 6-50 Klinekar 6-60	4 4 6 6	4 4 4 4 4 4 4 4 4	4# 52 5 5	L. Head. T. Head. T. Head. T. Head.	Sep'rate. Pairs Sep'rate. Pairs	R. Side Opposite Opposite Opposite	Flechter Flechter Flechter Plechter	Gravity Gravity Gravity Gravity	Double Double Double Double	Bosch Bosch Bosch	Pump Pump Pump	Tubular
Knox R Knox R Knox R-45 Knox S	4 4 6	5 5 5 5	47 54 47	I. Type I. Type I. Type I. Type	Sep'rate. Sep'rate. Sep'rate. Pairs	In Head In Head In Head In Head	Stromberg Stromberg Stromberg Stromberg	Gravity Gravity Gravity Gravity	Double Double Double Double	Bosch Bosch Bosch	Pump Pump Pump	Tubular Tubular Tubular
Krit A	4	3 3 3 3 3 3	4 4	L. Head. L. Head.	Bloc		Stromberg Stromberg		Single Single	Bosch	Thermal.	Tubular Tubular
Lambert 66-B Lambert 66-C Lambert 99-C Lambert 99-B Lambert 99-A	4 4 4 4	41	41 41 51 51 5	L. Head. L. Head. L. Head. L. Head. L. Head.	Bloc Bloc Sep'rate. Sep'rate. Sep'rate.	L. Side L. Side L. Side L. Side	Schebler Schebler Schebler Schebler Schebler	Gravity Gravity Gravity. Gravity.	Dual Dual Dual Dual	Remy Remy Remy Remy	Pump Pump Pump Pump Pump	. Tubular . Cellular
Leader 40	4	41	51	L. Head.	Pairs	L. Side	Schebier	1	Dual	Remy	Thermal.	1
Lenox	4	41	51	L. Head.	Pairs	Side	Sauer	Gravity.	Dual		Pump	. Cellular

S. & H., side and head; R. right; L. left; Spl., splash: In Fil, in fuel; E. Bid, expanding band; C. Bid, contracting band; Exp., expanding; C. & D., cone and disc; D.Pl., dry plate; A. & I., asbestos and iron; A. & S., asbestos and steel; B. and S., bronze and steel; C. & B., cork and bronze; C. & S., cork and steel; F. & S.,

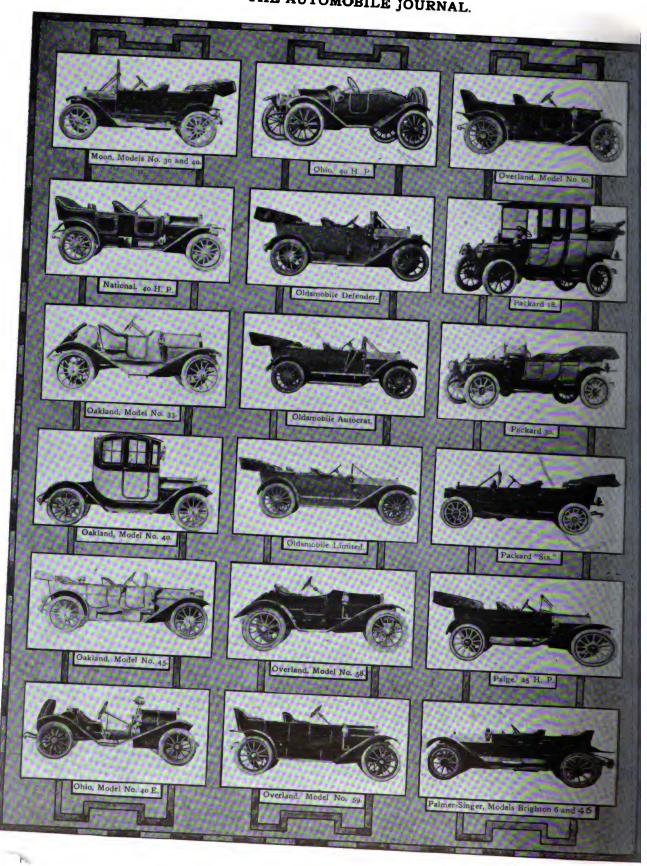


Standard Gasoline Pleasure Vehicles.—(Cont.)

					TRA	(SMISSIC	MC					RUN	NINC	GEA	AR	
Motor Lu-	CLU	тсн	G	EAR	SET	Drive	Car Drives	Rear	BRA	KES	2	Front	SPRI	ngs	TIF	ES
brica- tion	Туре	Fric. Surf.	Туре	No	Loca- tion		Through	Axle	Ser.	Em.	Wheelbase	Axle	Fr.	Rear	Fr.	Rear
	Cone	L. & S	Select. Select.	3	Amid	Shaft Shaft		Ploating Floating	Ext Ext	Int Int	135 138	I-b'm I-b'm		:::::	36x00 36x4}	37x5
Spl		S. & R Leath'r.			U. Mo Amid	Shaft Shaft	Tor. Tube Tor. Tube	Semi-float'g. Floating	Int Int	Ext Ext	113 1 28	I-b'm I-b'm	EU	Eu Eu	34×4 00×4	34x4 00x4}
		Raybes. Raybes.			Amid Amid	Shaft Shaft	Tor. Tube Tor. Tube	Semi-float'g. Semi-float'g.	Ext	Int Int	114 114	I-b'm I-b'm	E11	Eu.	. 34x3½ . 35x4	34 x3 1 35 x 4
		L. & I L. & I			Amid	Shaft Shaft	Springs Rad. Rd	Semi-float'g. Ploating	Ext Ext	Int Int	116 123	I-b'm I-b'm	E11	Plat. Plat.	. 34x4 . 36x4	34x4 36x4
		L. & I Steel Steel		1				Semi-float'g. Ploating Ploating				I-b'm Channel I-b'm				
Spl Spl	C.B'd C.B'd	S. & B S. & B S. & B	Select Select	3 3 3	U. Mo U. Mo	Shaft Shaft	Springs	Floating Floating Floating	Ext Ext	Int Int	114 120	I-b'm I-b'm I-b'm	E11	EII EII	34x4 36x4 36x4	34x4 36x4
	1	S. & R.	ı			1	1	Ploating	•				€11.	1	36x4	
Spl Spl	M.Disc M.Disc	S. & R S. & R	Select Select	3	R. Ax U. Mo	Shaft Shaft	Rad, Rd Rad, Rd	Semi-float'g Ploating	Ext	Int Int	115½ 116	I-b'm I-b'm	E11.	E11	34x4 34x4	34x4 34x4
Spl Spl	M.Disc M.Disc	Steel Steel	Select.	3	U. Mo U. Mo	Shaft Shaft	Tor. Tube . Tor. Tube .	Semi-float'g. Semi-float'g.	Ext Ext	Int Int	100 110	I-b'm I-b'm	₹ E11	1 E11	32x3 32x3	32x3 32x3
Spl Spl	M.Disc M.Disc	S. & C S. & C	Select Select		U. Mo U. Mo	Shaft Shaft	Tor, Tube Tor, Tube	Floating Floating	Ext . Ext	Int Int	1143	I-b'm I-b'm	1 E11 2 E11.	Ell	32x4 34x4	32x4 34x4
Spl	M.Disc M.Disc	Steel Steel	Select Select	2 2	U. Mo U. Mo	Shaft Shaft	Tor. Tube Tor. Tube .	Semi-float'g Semi-float'g	Int Int	Ext Ext	86 110	I-b'm I-b'm	Ell.	::	30x3 30x3	30x3 31x3
Spl	ì	Steel	1	1	1	1	1	Ploating	i .	L	1	I-b'm		1		37 x 4
Spi	M. Disc	Steel Steel Steel Leath'r.	Select.	. 3	U. Mo U. Mo U. Mo Amid	Shaft Shaft Shaft Shaft	Tor, Tube Tor, Tube Tor, Tube Rad, Rd	Semi-float'g Semi-float'g Ploating Semi-float'g	Ext Ext Ext Ext	Int Int Int Int	114 116 120 118	I-b'm I-b'm I-b'm I-b'm	EII.	EII.	34x3 34x4 36x4 34x4	34x33 34x4 36x4 34x4
Spl Spl Spl	M.Disc M.Disc M.Disc	S. & B. S. & B. S. & B.	Select Select Select	3 4				Semi-float'g. Ploating Floating				T-b'm T-b'm T-b'm	II EII.	Ell Ell Ell	34x4 36x4 36x4	34×4 36×4 36×4
Spl Spl Spl	Cone Cone M.Disc	L. & I L. & I Iron L. & I	Select Select Select Select	3 3 3	U. Mo U. Mo U. Mo U. Mo	Shaft Shaft Shaft Shaft	Rad. Rd Rad. Rd Rad. Rd Rad. Rd	Semi-float'g. Semi-float'g. Semi-float'g. Semi-float'g.			110 110 118 124	I-b'm I-b'm I-b'm I-b'm	EII EII EII	Ell. Ell. Ell.	32x3 32x3 34x4 36x4	32x3 32x3 34.4 36x4
	Cone	Leath'r.	Prog.	. 3		Shaft		Ploating			118	I-b'm	Bu.	. eu	I	36x00
Spl Spl	Cone	Leath'r. Leath'r. Leath'r.	Select Select Select	3 3	Amid Amid	Shaft Shaft	T.T &R.R. T.T.&R.R. T.T.&R.R.	Floating Floating Floating	Int Int	Int Ext	112 112 124	Channel I-b'm I-b'm	EIL.	EIL	34x3 36x4	34x3± 36x4 36x4±
		Steel Steel S. & R.						Semi-float's Semi-float's Ploating			104 104 120	I-b'm I-b'm I-b'm		Eli Eli Plat	i	32x3 32x3 32x3 36x4
Spl	M. Disc	Steel	Select	. 2	U. Mo	Shaft		Semi-float'g	Int	Ext	100	Tube	1	1	•	1
Sol	com	Steel L. & I	Salact		1	I	1	Semi-float'g	1	1	115	Channel I-b'm	1.		1	34×4
Spl Spl	Cone Cone	L. & I L. & I L. & I	Select Select Select					Ploating Ploating Ploating Ploating			118 124 132	I-b'm I-b'm I-b'm I-b'm	EII. EII. EII.	EU EU EU	35x4 36x4 37x5	35x44 36x44 37x5
-Spi	Cone	Leath'r. Leath'r. Leath'r. Leath'r.	.[Select	. 1 4	Amid	Shaft	Springs	Ploating Ploating Ploating Ploating	1	1	118 118 126 130	I-b'm I-b'm I-b'm I-b'm	EII. EII. EII.	EII EII EII	. 34x4 . 36x4 . 36x4 . 38x4	34x4 36x4 36x4 38x4
Porced Porced Porced Porced	M.Disc M.Disc M.Disc M.Disc	I. & C I. & C I. & C I. & C	Select Select Select Select	3	U. Mo U. Mo U. Mo U. Mo	Shaft Shaft Shaft Shaft	T. & R. R. T. & R. R. T. & R. R. T. & R. R.	Semi-float'g. Floating Floating Ploating	Ext Ext Ext Ext	Int Int Int Int	117 122 126 134	I-b'm I-b'm I-b'm I-b'm	EII. EII. EII.	Ell Ell Ell	. 36x4 . 36x4 . 37x5 . 38x5	36x4 36x4 37x5 38x5
		Steel Steel		2 3	U. Mo.	Shaft	Tor. Tube.	1	Ext	Int	90	I-b'm I-b'm				
Spl Spl Spl Spl			Pric Pric Pric Pric		Amid Amid Amid Amid	Chain Chain Chain Chain	Rad. Rd Rad. Rd Rad. Rd Rad. Rd	_	Ext Ext Ext Ext	Int Int Int Int	107 112 112	Tube I-b'm I-b'm I-b'm				
	ł	Steel		3		Cjiain.	Rad. Rd	Floating	LA	*****	1113	I-b'm		1	34x4 36x4	1
Porced	Cone	Leath'r.	Select	. 3	R. Ax	Shaft	Tor. Tube.	Semi-float'g.	Ext	Int	116	I-b'm	₽ Eu.	. i Eu	34×4	34×4

fibre and steel: F. & I., fibre and iron; Fa. & S., fabric and steel: I. & C., iron and cork; L. & I., leather and iron; L. & C., leather and cork; L. & A., leather and asbestos; R. & I., Raybestos and iron; S. & B., steel and bronze; S. & R., steel and cork; T. & I., Thermoid and iron; U.Mo., unit motion

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Tabulated Detailed Specifications of 1912

MOTOR

	_											
MAKE	e a			Cylinder	Cylinder How Cast	Valve	CARBUR	ETION	TGNT	TION	coo	LING
	Cylinders	Bore	Stroke	Туре	Cast	Location	Dosign	Fuel Feed	System	Magneto	Circula- tion	Radia- tor
Lexington DF Lexington F	4	41	S I	L. Head. L. Head.	Sep'rate. Sep'rate.	L. Side L. Side	Schebler	Pressure.	Double	Bosch	Pump	Cellular. Cellular.
Lion 40	4	41	5	L. Head.	Pairs,	S. & H	Stromberg	Gravity	Dual	Kingston.	Pump	Tubular
Locomobile L-4	4 6	11	4	T. Head. T. Head.	Pairs Pairs	Opposite	Own	Gravity Gravity	Dual Dual	Bosch	Pump	Cellular, Cellular,
Lozier 46. Lozier 51.	4 6	5	6	T. Head. T. Head.	Pairs Pairs	Opposite	Own	Pressure. Pressure.	Double	Bosch	Pump Pump	Cellular. Cellular.
Luverne 540 Luverne 750	4	#	42	L. Head. L. Head.	Pairs Sep'rate.	L. Side L. Side	Schebler	Gravity Gravity.	Double Double	Bosch	Pump Pump	Tubular Tubular
Marathon K-20 Road	4	31	34	L. Head. L. Head.	Pairs	Side Side	Kingston Kingston Schebler	Gravity Gravity	Dual	Remy	Thermal	Tubular
Marathon I_30 Marathon M-40 Marathon M-40 Tour	14	4	37	L. Head. L. Head. L. Head.	Pairs Pairs	Side Side	Schebler	Gravity.	Dual Dual	Remv	Thermal Thermal Thermal	Tubular Tubular
Marathon M-40 Tour Marathon N-50	4	#	5	L. Head. L. Head.	Pairs Pairs	Side	Schebler Schebler	Gravity. Gravity.	Dual Dual	Remy Remy Remy	Thermal Thermal	Tubular Tubular
Marion 35 Marion 34-37 Marion 46-47-48	1	1.	4 i 5 5 i	L. Head. L. Head.	Sep'rate. Pairs	L. Side L. Side L. Side	Schebler Schebler	Gravity. Gravity	Dual Dual Dual		Thermal Pump Pump	Cellular. Cellular.
Marmon 32	4	43	5	T. Head.	l .	Opposite.		Gravity	Dual	Bosch	Pump	1
Marquette 23-24-25-27 Marquette 28	4	S 5	5 51	T. Head. T. Head.		Opposite. Opposite.	Schebler Zenith	Gravity Gravity	Double Double	Bosch Splitdorf	Pump Pump	Cellular. Cellular.
Matheson 50 Matheson 50	6	#	5.	I. Type . I. Type .	Pairs Pairs	In Head. In Head.	Stromberg Stromberg	1	Double Double	Bosch Bosch	Pump	Cellular. Cellular.
Maxwell Messenger	2	43	4	L. Head.	Sep'rate.	Side	Own	Gravity	Dual	Splitdorf Splitdorf	Thermal	
Maxwell Mascotte. Maxwell Mercury. Maxwell Special	4	1	4 4 5 5	T. Head.	Pairs Sep'rate.	Opposite. Opposite.	Own Stromberg Stromberg	Gravity Gravity	Dual Dual	Bosch	Thermal Thermal	Tubular Tubular
McParian 40-45	6	**	51	I. Head.	Sep'rate. Threes	Opposite.	Stromberg	Gravity	Dual	Splitdorf		Cellular.
McFarlan 55-60	6	41	5	Head	Threes	Opposite.			Dual		Pump	Cellular.
McIntyre F-12.	4	4	5	T. Head.	Sep'rate.	Opposite.	Schebler	Gravity Pressure.		Briggs		Tubular. Cellular.
Mercer 35-R Mercer 35-A and B	1	1	5 5	T. Head.	Pairs Pairs	Opposite. Opposite.	Flechter	Pressure.	Single Dual	Bosch-2 Bosch-2	Pump	Cellular.
Metz 23	4	31	4	L. Head.	Bloc	Side	Holley		Single	Bosch	Thermal	
Midland L-3. Midland R. Midland O	4 4 6	41 41 4.36	5 5 5	T. Head. T. Head. T. Head.	Pairs	Opposite. Opposite. Opposite.	Own Own	Gravity	Double Double Double	Splitdorf. Splitdorf. Mea	Pump	Cellular. Cellular. Cellular.
Mitchell 4.	4	3	5 }	L. Head.	Pairs	L. Side	Stromberg		Dual	Splitdorf.	Pump	Tubular.
Mitchell 5-4. Mitchell 5-6 and 2-5. Mitchell 7-6.	6	3	51	L. Head. L. Head.	Pairs	L. Side S. & H L. Side	Stromberg Holley Stromberg Stromberg	Gravity Gravity	Dual Dual	Splitdorf. Splitdorf.	Pump	Tubular. Cellular.
	6	-	5		Pairs	Side			Dual	Splitdorf.	-	Cellular.
Moline 35 Touring	4.4	4	6	L. Head. L. Head.	Pairs Pairs	L. Side Side	Schebler		Double:	Splitdorf. Splitdorf.	Thermal	
Moon 30 Moon 40 Moon 45	4 4	44	5 5 5	T. Head. T. Head. I. Type	Pairs	Opposite. Opposite. In Head.	Stromberg Stromberg Stromberg	Gravity Gravity Gravity	Dual Dual Dual	Remy Remy Bosch	Pump Pump	Cellular Cellular Cellular
Morse D	4	48	5			In Head.		l I				Cellular.,
Motorette R*	2	31	3	2-Cycle	Sep'rate.		Own	Gravity	Single		Thermal	Tubular.
National Roadster National Touring	4	S	#	T. Head. T. Head.	Pairs Pairs	Opposite. Opposite.	Schebler	Pressure. Gravity	Double Double	Splitdorf. Bosch	Pump Pump	Cellular Cellular
New Parry 35	4	41	43	I. Type	Pairs	In Head.	Schebler	Gravity	Dual	Optional.	Pump	Cellular
Oakland 30 Oakland 40	4	4	4	L. Head. L. Head.	Pairs	L. Side L. Side	Schebler Schebler Schebler	Gravity Gravity	Dual Dual	Remy	Pump	Tubular. Tubular.
Oakland 45. Octoauto†	4	44	44 54 44	L. nead.	Pairs Sep'rate.	L. Side		Gravity Gravity	Dual	Bosch	Pump	Tubular. Cellular.
Ohio Reguler	4	结	42	T. Head.	Pairs	Opposite.	Schebler	1	Dual	Bosch	Pump	Cellular.
Ohio Speedster	4		42	T. Head.	Pairs	Opposite.		1 I	Double	Bosch		Cellular.
Oldsmobile Defender Oldsmobile Autocrat Oldsmobile Limited	4 6	4 5 5	6 6	T. Head. T. Head. T. Head.	Pairs Pairs Pairs	Opposite. Opposite. Opposite.	Own Own	Pressure Pressure Pressure	Dual Dual Dual	Bosch	Pump	Cellular, Cellular, Cellular,
Only	4	41	7%	T. Head.		Opposite.	Own	Gravity.	Double	Bosch	Thermal	Tubular.
Οπο	4	42	41	T. Head,	Pairs	Opposite	Stromberg	Gravity.	Dual	Bosch	Pump	Cellular.
					1.2			·		•		

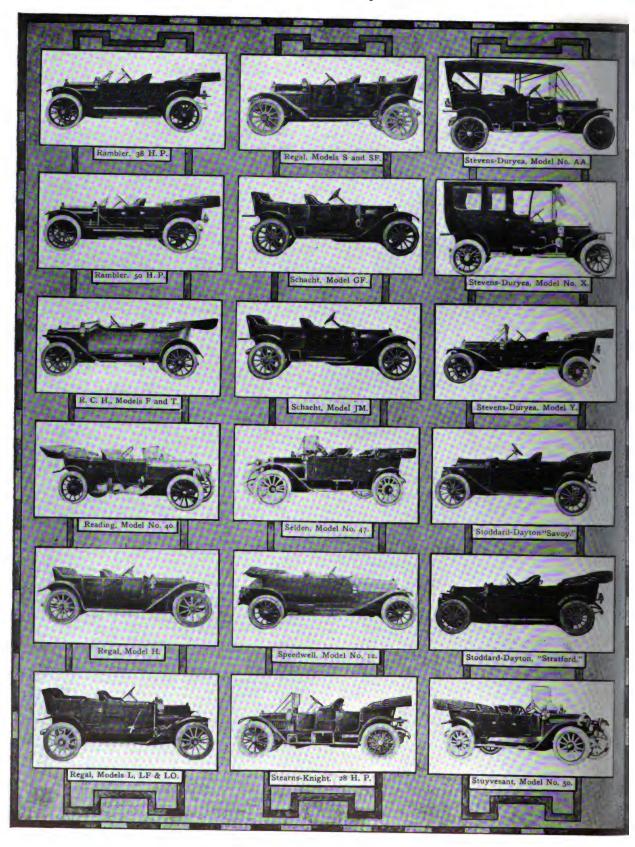
S. & H., side and head; R, right; L, left; Spl., splash; In Fil, in fuel; E. Bid, expanding band; C. Bid. contracting band; Exp., expanding; C. & D., cone and disc; D.Pl., dry plate; A. & I., asbestos and iron; A. & S., asbestos and steel; B, and S., bronze and steel; C. & B., cork and bronze; C. & S., cork and steel; F. & S.,

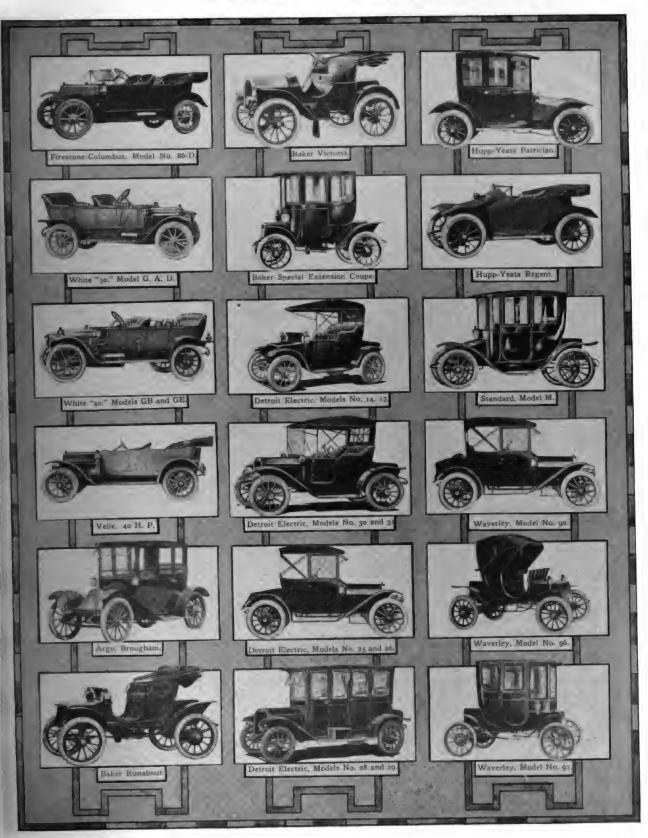
Standard Gasoline Pleasure Vehicles.—(Cont.)

					T	RANSMI	SSION					RU	NNIN	G GE	\R	
Motor Lu-	CLU	TCH	G	RAR	SET	Drive	Car Drives	Rear	BRA	KES	•	Front	SPR	INGS	TII	RES
brica- tion	Туре	Fric. Surf.	Type	No.	Loca- tion	-	Through	Axle	Ser.	Rm.	Whoelbase	Azie	Fr.	Rear	Fr.	Rear
Spl Spl	Cone	Leath'r. Leath'r.	Select. Select	3	U. Mo Amid	Shaft Shaft	Springs	Ploating	Ext Ext	Int Int	117 122	I-b'm I-b'm	E11	Ell.	34×4 36×4	34x4 36x4
Spl	Cone	R. & I	Select.	3		Shaft		Ploating			116	I-b'm	ł Eu			36x4
Spl Spl	M.Disc M.Disc	Leath'r. Steel	Select Select	4	Amid Amid	Shaft Shaft	Tor. Tube Tor. Tube	Ploating	Ext Ext	Int Int	120 135		Bu Bu	Bu.	34x4 1 36x4	34x44° 37x5
Spl	M.Disc M.Disc	Steel Steel	Select Select	4	Amid Amid	Shaft Shaft	Rad, Rd Rad, Rd	Ploating	Ext Ext	Int Int	124 131	I-b'm	Bu	Plat Plat	36x4 36x4	36x5 36x5
Spl Spl	M.Disc M.Disc	Steel Steel	Select Select	4	Amid	Shaft Shaft		Ploating	:::::		124 128	I-b'm I-b'm	B11	EU	34x4 36x4	34x4 36x4
Spl Spl Spl Spl Spl	M.Disc M.Disc M.Disc M.Disc M.Disc M.Disc	Steel Steel Steel Steel Steel	Prog. Prog. Select Select Select Select	2 2 3 3 3 3				Semi-float'g. Semi-float'g. Semi-float'g. Floating. Floating.			90 96 116 118 120	I-b'm I-b'm I-b'm I-b'm I-b'm		EII EII EII EII EII	34x3 34x4 34x4 34x4 37x4	34x3 34x4 34x4 37x4
Porced Spl Spl	Cone Cone Cone	A. & I A. & I A. & Z	Select Select Select					Semi-float'g. Semi-float'g. Ploating				I-b'm I-b'm I-b'm				32x4 34x4 36x4
Porced	1	Therm.	l .		1	1		Ploating		1	120 ;	I-b'm		1	1 1	_
Spl Spl	1	Leath'r. Leath'r	1		Amid			Ploating			122 119		EII		1 1	
Spl Spl	M.Disc M.Disc	Steel Steel	Select Select	3				Ploating			125± 135	I-b'm I-b'm			36x4 36x4	
Spl Spl Spl Spl	M.Disc M.Disc M.Disc M.Disc	S. & B. Steel Steel Steel	Plan . Select Select Select	3 3 3	U. Mo U. Mo U. Mo U. Mo	Shaft Shaft Shaft Shaft	Tor. Rod Springs Springs	Semi-float'g Semi-float'g Semi-float'g Floating	Ext Ext Ext Ext	Tran. Int Int Int	86 104 110 114	Tube Tube Tube I-b'm	EU EU EU	EU EU EU BU	28x3 32x3 34x4 34x4	28x3 32x3 34x4 34x4
Spl Spl		Steel Steel				1					124 128	I-b'm I-b'm			36x4 37x4≩	
Spl	11	Steel			R. Ax.	i		. Semi-float'g			114	I-b'm			34x3}	1
Spl Spl	M.Disc	Steel Steel	Select Select	3 4	Amid	Shaft Shaft	Rad. Rd Rad. Rd	Ploating	Tran Tran	Int Int	108 118	I-b'm I-b'm	E11	Ell.	32x4 34x4	32x4 34x4
Spl			1				1	Dead			90	Tube	1		1 1	30x3
Spl Spl Spl	M.Disc M.Disc	Raybes Raybes Raybes	. Select	. 3				Ploating Ploating Ploating			115 118 118	Channe I-b'm I-b'm				
Spl Spl Spl Spl	Cone Cone Cone	Leath's Leath's Leath's Leath's	Select Select Select Select	3 3 3	R. Ax. Amid Amid Amid	Shaft Shaft Shaft Shaft	Tor, Tube. Tor, Tube. Tor, Tube. Tor, Tube.	Floating Ploating Ploating	Int Int Int	Ext Ext Ext Ext	100 112 125 135	I-b'm I-b'm I-b'm I-b'm	EU EU EU	EU EU EU EU	32x3 1 34x4 36x4 36x4 <u>1</u>	32x31 34x4 36x4 36x41
Spl Spl	Cone.	Leath's	Select	. 3				. Semi-float'g Semi-float'g				I-b'm I-b'm	E11	E11 Bn	37x4 36x3	37x4 36x3}
Spl Spl Spl	M.Dise M.Dise M.Dise	Steel Steel Steel	Select	. 3	R. Ax. Amid Amid	Shaft Shaft Shaft	Rad. Rd Springs Springs	Semi-float'g Ploating	Ext. Ext. Ext.	Int Int Int	115 120 123	I-b'm I-b'm I-b'm	EU EU EU	EU. EU. EU.	34x4 36x4 36x4	34x4 36x4 36x4
Spl		Steel	ı					. Semi-float's			1	. [-b'm	1-		36x4}	ı
In F1.		Leath'					Springs	1	Int.	1	124		EII			29x31
Porces	1	L. & I.	1		1	1		Floating	1		1	I-b'm I-b'm				'
Spl	1	L. & S.	l .	•				. Semi-float's	1		116	I-b'm	-			34x00
Spl Spl		L. & I. L. & I. L. & I.	1					Semi-float's Semi-float's Ploating			112 120.	I-b'm I-b'm I-b'm		EU. EU.	34x4 36x4 34x3	
Spl	I	S. & B.		1	1			. Floating . Ploating		1	1	I-b'm I-b'm		EII.	1	1
Spl Porced	Cone.	T. & I.	. Selec	E. 14	Amid	Shaft	Tor Tube	Pleating	Int	Ext	105					
Porces Porces	Uone.	T. & I.	. Select	t. 4	Amid	Shaft	Tor, Tube	Ploating	Int	Ext.	126 140	I-b'm I-b'm I-b'm	Eu	EU.	38x44 42x4	39x5 43x5
Porces	1	Leath'	1	- 1	1	1	1	. Semi-float's	1.	1.	1		E11.		31x4	
Splasi	Cone.	Leath'	r. Select	t. 3	R. AX.	Snart.	lor. Tube	Ploating	. Ext.	· lint.	123	11-0 m	3 Eu	R RII	34x3\$	34X3·

fibre and steel; F. & I., fibre and iron; Fa. & S., fabric and steel; I. & C., iron and cork; L. & I., leather and iron; L. & C., leather and cork; L. & A., leather and asbestos; R. & I., Raybestos and iron; S. & B., steel and bronze; S. & R., steel and Raybestos; S. & C., steel and cork; T. & I., Thermold and iron; U.Mo., unit motion.







Tabulated Detailed Specifications of 1912

							мот	OR				
MAKE	lers			Cylinder	Cylinder How	Valve	CARBUR	ETION	IGN	TION	coo	LING
	Cylinders	Bore	Stroke	Туре	Cast	Location	Design	Fuel Feed	System	Magneto	Circula tion	Radia- tor
Overland 58 Overland 59 Overland 60 Overland 61	4 4 4	32 4 4 41 42	4½ 4½ 4½ 4½	L. Head. L. Head. L. Head. L. Head.	Sep'rate. Sep'rate. Sep'rate. Sep'rate.	L. Side L. Side L. Side L. Side	Schebler Schebler Schebler Schebler	Gravity. Gravity. Gravity. Gravity.	Dual Dual Dual Dual	Splitdorf Splitdorf Remy Bosch	Thermal. Thermal. Thermal.	Tubular Tubular Tubular Tubular
Packard 18 Runabout Packard 18 Standard Packard 30 Runabout Packard 30 Standard Packard 30 Phaeton Packard 6 Runabout Packard 6 Runabout Packard 6 Paneton	4 4 4 4 6 6 6	4 18 4 18 5 5 5 5 4 1 4 1 4 1 4 1 4 1 4 1 4 1 4 1 4 1 4 1	5 to 6 6 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	T. Head. T. Head. T. Head. T. Head. T. Head. T. Head. T. Head. T. Head.	Pairs Pairs Pairs Pairs	Opposite Opposite Opposite Opposite Opposite Opposite Opposite Opposite	Own. Own. Own. Own. Own. Own. Own.	Pressure Gravity. Pressure Gravity. Pressure Pressure Gravity Pressure	Dual Dual Dual Dual Dual Dual Dual Dual Dual	Eisemann. Eisemann. Eisemann. Eisemann. Eisemann. Bosch. Bosch.	Pump	Cellular.
Paige Beverly	4	31	4	L. Head.	Ploc	L. Side.	Meyer	Gravity.	Single	Bosch	Thermal	Cellular.
Palmer-Singer 6-40 Palmer-Singer 46 Palmer-Singer 6-60	6 6	4 4 4 ⁷ 4 ⁸	5 5 5 1	T. Head. T. Head. T. Head.		Opposite Opposite Opposite	Own Own	Pressure Pressure Pressure	Double	Bosch Bosch	Pump Pump	Cellular. Cellular. Cellular.
Paterson 35Paterson 45	4 4	4 4 3	4 51	L. Head. L. Head.	Pairs	L. Side L. Side	. Schebler . Schebler	Gravity. Gravity.	Dual	Bosch	Pump	Cellular Cellular
Pathfinder 40	4	41	5 1	L. Head.	Bloc	Side	. Schebler	Gravity.	Dual	Optional	Thermal.	Cellular.
Peerless D Peerless H Peerless K Peerless L	4 6 4 6	4 4 5 4 4 5	4 B 5 2 5 3 6 7	L. Head. T. Head. T. Head. T. Head. T. Head.	Pairs Pairs Pairs Pairs	L. Side Opposite Opposite Opposite Opposite	OwnOwnOwnOwnOwnOwn	Gravity.	Double	Bosch	Pump Pump Pump Pump	Tubular Tubular Tubular Tubular Tubular
Penn RF and T4	4 4	3 4 4 1	4½ 5½	L. Head. L. Head.	Bloc	R. Side R. Side	. Schebler	Gravity Gravity	Dual	Briggs Briggs	Thermal.	Tubular Tubular
Petrel 25 and 35	4	3 1 4 1 1	4 1 4 1	L. Head.	Pairs	L. Side L. Side	. Stromberg	Gravity Gravity	Dual	S-X Remy	Pump	Tubular Tubular
Pickard	4	4	4	T. Head.	Sep'rate.	Opposite	Breeze	Gravity	Single	K-W	Air	
Pierce-Arrow 36-R Pierce-Arrow 48-R Pierce-Arrow 48-T Pierce-Arrow 66-R Pierce-Arrow 66-T	6 6 6 6 6	4 4 4 4 5 5 5 5	5555577	T. Head. T. Head. T. Head. T. Head. T. Head. T. Head.	Pairs Pairs Pairs Pairs Pairs	Opposite Opposite Opposite Opposite Opposite Opposite	Own	Gravity. Gravity. Gravity.	Double Double Double Double Double	Bosch Bosch Bosch	Pump Pump Pump Pump Pump	Cellular Cellular
Pilot 40	4	4 1/2	5	T. Head.	Bloc	Opposite	Schebler	Gravity.	Single	Splitdorf	Pump	Cellular
Pope-Hartford 27 Pope-Hartford 28	4 6	418	5 ½ 5 ½	I. Type I. Type	Pairs	In Head. In Head.	Own		Dual Dual	Bosch	Pump	Tubular Tubular
Pratt 40	4	4 1/2	4 2	L. Head.	Pairs	L. Side	. Schebier	Gravity	Dual	Bosch	Pump	Cellular
Premier M-4 Premier M-6	4 6	44	5 t 5 t	T. Head. T. Head.	Pairs	Opposite Opposite	.Schebler Carter	Gravity Gravity	Dual Dual		Pump	Cellular Cellular
Pullman 4-30 Pullman 4-40 Pullman 6-60	4 4 6	4 1/8 4 ½ 4 ½	5 5 ½ 5 ½	T. Head. T. Head. T. Head.	Pairs Pairs Pairs	Opposite Opposite Opposite	Stromberg. Stromberg. Stromberg.	Gravity Gravity. Gravity.	Dual	Bosch Bosch	Pump Pump	Tubular Cellular Cellular
Rambler Cross Country Rambler Country Club Rambler Moraine Rambler Metropolitan	4 4 4 4	4 1 5 5 5 5	5.55	L. Head. L. Head. L. Head. L. Head.	Sep'rate Sep'rate Sep'rate Sep'rate	R. Side R. Side R. Side R. Side	Holley Stromberg. Stromberg. Holley	Gravity Gravity Gravity Gravity	Dual	Bosch Bosch Bosch	Pump Pump Pump	Tubular Tubular Tubular Tubular
Rayfield C	6	318	5	T. Head.	Pairs	Opposite.	Own	Gravity	Single	Optional	Thermal	Cellular
R. C. H. Runabout R. C. H. Touring	4 4	3 t 3 t	5	L. Head. L. Head.	Bloc	L. Side L. Side	Breeze	Gravity.	Single	Bosch	Thermal	Tubular Tubular
Reading 40	4	5	6	T. Head.	Bloc	Opposite.	Flechter	Gravity.	Double	Pittsfield	Pump	Tubular
Regal N. Regal L Regal H	4 4 4	3 ₹ 4 † 4 †	4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4	L. Head. L. Head. L. Head.	Bloc Pairs Pairs	L. Side L. Side L. Side	Schebler Schebler Kingston	Gravity, Gravity Gravity.	Dual Dual Dual	Michigan Michigan Michigan	Thermal Thermal Thermal	Tubular Tubular Tubular
Reo the Fifth	4	4	4 1/2	L. Head.	Pairs	In Head.	Holley	Gravity.	Single	National	Pump	Tubular
Republic 111-112-113	4	41	5	T. Head	Pairs	Opposite.	Stromberg.	Gravity	Double	Bosch	Pump	Tubular
Richmond M	4	4 4 1 2	5		Sep'rate Sep'rate.		Kingston Kingston	Gravity Gravity.	Dual	S-X	Thermal	Cellular Cellular
Ritter 1912	4	3 1	3 🖁	L Head.	Pairs	Side		Gravity.	Dual,	Remy	Thermal	Tubular
Roader 20	4	31	41	L. Head	Bloc	R. Side .	Own	Gravity	Single .	Bosch	Thermal	Cellular

S. & H., side and head; R, right; L. left; Spl., splash; In F'l, in fuel; E. B'd, expanding band; C. B'd, contracting band; Exp., expanding; C. & D., cone and disc; D.Pl., dry plate; A. & L. asbestos and iron; A. & S., asbestos and steel; B. and S., bronze and steel; C. & B., cork and bronze; C. & S., cork and steel; F. & S.,



Standard Gasoline Pleasure Vehicles.—(Cont.)

					TI	RANSMIS	SION					RU	NNIN	G GEA	R	
Motor Lu-	CLU	тсн	G	EAR	SET	Drive	Car Drives	Rear	BRA	AKES	2	Front		INGS	TII	RES
brica- tion	Туре	Fric. Surf.	Туре	No	Loca- tion		Through	Axle	Ser.	Em.	Wheelbase	Axle	Fr.	Rear	Fr.	Rear
Porced Porced Spl Spl	Cone	A. & I A. & I A. & I A. & I	Select	2 3 3 3	R. Ax R. Ax	Shaft Shaft	Tor. Tube Tor. Tube Tor. Tube Tor. Tube	Semi-float'g. Semi-float'g. Semi-float'g. Floating	Int Int Int	Ext Ext Ext	114 118	I-b'm I-b'm I-b'm I-b'm	EII EII EII	E11 E11 E11	32x3 32x3 34x4 34x4	32x31 32x31 34x4 34x4
Forced Forced	M. Disc M. Disc M. Disc M. Disc	F.&S F.&S F.&S	Prog Prog Prog	3	R. Ax R. Ax	Shaft Shaft	Rad. Rd Rad. Rd	Semi-float'g. Semi-float'g. Semi-float'g. Semi-float'g. Semi-float'g. Semi-float'g. Semi-float'g.	Ext Ext	Int Int	133	Tube Tube Tube Tube Tube Tube Tube	EII EII EII			37x5 37x5 37x5 37x5 37x5 37x5
Spl Spl Spl	1	S. & R Steel	Select. Select. Select. Select.	3 4 4	ı	1	Tor Tube	Semi-float'g: Semi-float'g: Ploating: Floating:			126 -	I-b'm I-b'm I-b'm I-b'm	EII		34×4	36x4
Spl	Cone Cone	Leath'r. Leath'r.	Select. Select.	1	ľ	1	1	Semi-float'g.	l	1 1	108 120 ·	I-b'm. I-b'm.	EII	1		32x3}
Spl Spl Spl Spl Spl	Exp	T. & A	Select	3 4 4 4 4 4 4	l·	1	Rad. Rd Rad. Rd Rad. Rd Rad. Rd Rad. Rd Rad. Rd	Ploating Ploating Floating Ploating Floating Floating	i			I-b'm., I-b'm., I-b'm., I-b'm., I-b'm., I-b'm.	- 1	-		34x44 36x44 37x5 37x5 37x5 38x54
Spl	Cone	Leath'r. Leath'r.	Select. Select:	3	Amid Amid	Shaft Shaft	Tor. Tube Tor. Tube	Semi-float'g. Semi-float'g.	Ext Ext	Int Int	105 · 115 ·	1-:-	Ell	Ell.	32x31 34x31	4
Spl	Cont	Leath'r.	Pric Pric	l l	Amid	Chain	Rad. Rd Rad. Rd Tor. Tube	Dead Dead Semi-float'g.	Tran.	Ext	98 · 115 ·	I-b'm. Tube.			32x3 34x3} 32x3}	34x3}
Spl Spl Spl Spl Spl Spl	Cone Cone Cone Cone Cone	l	Select. Select. Select. Select.		i	I .	1	Semi-float'g. Semi-float'g. Semi-float'g. Semi-float'g. Semi-float'g. Semi-float'g.	ı	1			EII EII EII EII EII		36,41 36x41 36x41 37x5 37x5	-
Spl Spl	Cone Cone Cone		Select Select Select.	3 '4 4	U. Mo Amid Amid		T. & R. R T. & R. R.	Semi-float'g. Ploating Ploating	Ext	Int	120 · 124 · 134 ·	1 1	} E11 } E11 } E11	-	36x4 36x4 38x4	
٠.	Cone	A. & S	Select.	3	Ü. Мо	Shaft	T.T.&R R.	Ploating	Int	Int	120	Chann	} E11	ĮEII.	36 x4	36x4
Spl Spl	M. Disc M. Disc Cone	S. & C S. & C	Select. Select. Select.	3		Shaft		Semi-float'g. Semi-float'g.	Int	Ext	126 · 140		EII		36x43 36x43	
Spl Spl Spl	Cone	L. & I	Select. Select.	4	Amid	Shart	Tor. Tube	Floating Floating Floating	Ext	Int			EII EII EII		34x4 36x4 36x4	
Spl Spl Spl Spl	Exp Exp Exp Exp	L. & I L. & I L. & I L. & I	Select. Select. Select. Select.	3 3 3	Amid Amid Amid Amid	Shaft Shaft Shaft Shaft	T.T.&R.R. T.T.&R.R. T.T.&R.R. T.T.&R.R.	Semi-float'g. Semi-float'g. Semi-float'g. Semi-float'g.	Ext Ext Ext Ext	Int Int Int Int	120 - 120 - 128 - 128 -	I-b'm. Tube. Tube. I-b'm.	EII EII EII	EII. EII. EII. EII.	36x4 36x4 40x4 40x4	36x4 36x4 40x4 40x4
Spl	Cone	S. & R A. & I	Select.	3	R. Ax			Floating Semi-float'g.				1	} E11 } E11 } E11		34x00 30x3	30x3
Spl	Cone	A. & I L. & I	Select.	3	R. Ax Amid			Semi-float g. Semi-float g. Ploating		I. I		I-b'm. I-b'm.			31x34 36x44	31x3}
Spl	Cone Cone Cone	L. & I	Select. Select. Select.	3 3 3	R. Ax R. Ax R. Ax	Shaft Shaft Shaft	Rad. Rd	Semi-float'g. Semi-float'g. Semi-float'g.			1		EII EII	E11. E11 E11.	32x21 32x31 34x4	32x31 32x31 34x4
		A. & S						Semi-float'g.		Int	112	1 1	} Ell		34x33	, -
Spl		Leath'r. Leath'r. Leath'r.			Amid Amid	1 3		Ploating Semi-float'g. Semi-float'g.		Įnt	120 106	l i	EII		36x4 3 32x3 4 34x4 3	
		Leath'r. Steel		1				Semi-float'g. Semi-float'g.	Int	Int	90	1 1	EII	- 1	34x4 3	
	1	Steel			R. Ax.	!!		Semi-float'g	Ext	Int	105	1 1	} E11 I		30x3 0	

fibre and steel. F. & I., fibre and iron; Fa. & S., fabric and steel; I. & C., iron and cork; L. & I., leather and iron; L. & C., leather and cork; L. & A., leather and asbestos; R. & I., Raybestos and iron; S. & B., steel and bronze; S. & R., steel and Raybestos; S. & C., steel and cork; T. & I., Thermoid and iron; U.Mo., unit motion.



Tabulated Detailed Specifications of 1912

							мото	PR				
MAKE	Cylinders			Cylinder	Cylinder How	Valve	CARBUI	RETION	IGI	NITION	cod	DLING
	Cylin	Bore	Stroke	Туре	Cast	Location	Design	Fuel Feed	System	Magneto	Circula- tion	Radiator
Rogers C	2	42	4	L. Head.	Sep'rate.	Side	Kingston	Gravity.	Single		. Air	
Schacht B. Schacht G-F.	2 4	5≩ 4 ਜੈ	41/2	L. Head. L. Head.	Bloc	R. Side	Schebler	Gravity.	Single	. Splitdorf	Thermal.	. Cellular
Schlosser 1912	4	5	6	T. Head.	Pairs	Opposite	G. & A	Pressure.	Dual	Bosch	Pump	Cellular
Sebring 6	6	318	4	I. Type.	Pairs	In Head	Stromberg.	Gravity		Optional	Pump	Cellular
Selden 47	4	41	4	L. Head.	Pairs	L. Side	Stromberg	Gravity	Double	Bosch	Pump	. Cellular
S. G. V., A S. G. V., D	4	3‡ 4	4 1 5 1	L. Head. L. Head.	Bloc	L. Side · L. Side ·	Own	Gravity Gravity	Single	Bosch	Pump	. Cellular
Shelby 40	4	41	51	L. Head.	Sep'rate.	Side	Schebler	Gravity	Dual	Remy	Pump	Tubular
Simplex 38 Simplex 38 Simplex 50 Simplex 50 Simplex 50	4 4 4 4	4 in 5 5 5 5 5	65555	T. Head. T. Head. T. Head. T. Head. T. Head.	Pairs Pairs Pairs Pairs Pairs	Opposite Opposite Opposite Opposite	Own Own Own Own	Pressure. Pressure. Pressure. Pressure. Pressure.	Single Single Single Single Single	Mea	Pump Pump Pump Pump	Tubular Tubular Tubular Tubular Tubular
Spaulding CP. Spaulding E.	4	4 41	4 51	L. Head. L. Head.	Pairs Sep'rate.	L. Side L. Side	Schebler Schebler	Gravity Gravity	Dual Double	Remy	Pump	Cellular.
Speedwell 12	4	5	5	L. Head.	Pairs	L. Side	Schebler	Gravity	Dual	Bosch	Pump	Cellular.
Spoerer 25A Spoerer 40-C	4	4 h 4 h	5 1 5 1	L. Head. T. Head.	Pairs Pairs	R. Side Opposite.	G. & A G. & A	Gravity Pressure.	Dual	Bosch	Pump Pump	Cellular.
Stafford	4	41	4 8	I. Type	Pairs	In Head	Stromberg:	Gravity	Dual	Bosch	Opt	Tubular.
Staver 35-B Staver 35-F Staver 40-F. Staver 40-RR	4 4 4	4# 4± 4± 4±	5 5 5	T. Head.	Bloc	Opposite Opposite Opposite Opposite	Schebler Schebler Schebler Schebler	Gravity Gravity Gravity Pressure.	Dual	Splitdorf Simms Simms	Pump Pump Pump Pump	Cellular Cellular Cellular Cell
Stearns-Knight Runabout Stearns-Knight Regular	4	4± 4±	5 ½ 5 ½	Sleeve Sleeve	Pairs Pairs	In Sleeve In Sleeve	Own	Pressure. Pressure.	Dual	Bosch	Pump	Cellular
Stevens-Duryea X	6 6	4 7 4 7 4 7 4 7	43 42 43	L. Head. L. Head. L. Head.	Pairs Pairs Pairs	L. Side L. Side L. Side	Own		Double	Bosch Bosch	Pump Pump Pump	Cellular Cellular Cellular
Stoddard-Dayton Savoy Stoddard-Dayton Stratford Stoddard-Dayton Saybrook Stoddard-Dayton Special Stoddard-Dayton Special Stoddard-Dayton Knight	4 4 4 6	4 4 4 4 5 5 4	4 1 5 1 5 1 5 1 5 1 5 1 5 1 5 1 5 1 5 1	I. Type I. Type I. Type	Bloc Pairs Pairs Pairs Pairs	Side Side In Head In Head In Head	Stromberg Stromberg Stromberg Stromberg	Pressure. Pressure. Pressure.	Double Double Double	Bosch Bosch Bosch Bosch	Thermal Thermal Pump Pump	Cellular Cellular Cellular Cellular Cellular Cellular
Stutz A	4	42	51	T. Head.	Pairs	Opposite	Schebler	Gravity	Dual			Cellular
Stuyvesant 50	4	47	6	T. Head.	Pairs	Opposite	Stromberg	Pressure.	Double	Bosch		Cellular.
Suburban Limited	6	3 1	4 1	L. Head.	Pairs	L. Side	G. & A	Gravity	Dual	Simms		Cellular
Thomas 6-40	6	41	5 1	T. Head.	Pairs	Opposite	Miller	Pressure.	Double	OptionalI		Cellular.
Triumph	4	41	5	L. Head.	Pairs	Side	Optional	Gravity,	Dual			Tubular
Union 3	4	3 🛊	4	I. Type	Pairs	In Head	Schebler	Gravity .	Single	Simms		Tubular.
Velie GVelie StandardVelie Special	4 4	4 ± 4 ± 4 ± 4 ± 5	5 t 5 t 5 t	L. Head. L. Head. L. Head.	Pairs	L. Side	Stromberg	Gravity.	Double	Splitdorf F	ump	Cellular. Cellular Cellular
Virginian A-50	4	5	5	L. Head.	Pairs		Schebler	_				Tubular.
Warren 12-30 Warren 12-35 Warren 12-40	4 4 4	4 4 1 4 1 4 1	41	L. Head.	Bloc Bloc	R Side	McCord	Gravity.	Double	Bosch F	ump	Cubular. Cubular.
Westcott K-L-M Westcott R	4	41	5	L. Head.		Side	Schebler Schebler	Gravity.	Dual	Bosch P	ump	Cellular.
W. F. S., B	4	43	51			L. Side						Cellular.
White GAD White GB White GE	4 4	34	5 to 5 to 5 to 5 to 5 to 5 to 5 to 5 to	L. Head. L. Head.	Bloc	Side	Own	Gravity. Gravity.	Single	BoschP	umpC	ellular ellular ellular
Wilcox 35	4	41	5			Side						ubular
Winton 17-C	6	41/2	5		1	R. Side	Stromberg					ellular.
Zimmerman Z-40-RZimmerman Z-40-F	4	4 1/2 4 1/8	5	L. Head. L. Head.		In Head	Schebler		Dual	Splitdorf T	hermal C	ellular.
		1.6	_	. Days		raca-1			Juni	Splitdorf. T	hermalC	ellular.

S. & H., side and head; R, right; L, left; Spl., splash; In F'l, in fuel; E. B'd, expanding band; C, B'd, contracting band; Exp., expanding; C, & D., cone and disc; D.Pl., dry plate; A, & I., asbestos and iron; A, & S., asbestos and steel; B, and S., bronze and steel; C, & B., cork and bronze; C, & S., cork and steel; F, & S.,



Standard Gasoline Pleasure Vehicles.—(Cont.)

					TRA	NSM1SSI	ON					RUN	INING	GEA	R	
Motor Lu-	CLU	тсн	GE	ARS	ET ·	Drive	Car Drives	Rear	BR	AKES	3	Front	SPR	INGS	TI	RES
brica- tion	Туре	Fric. Surf.	Туре	No.	Loca- tion		Through	Axle	Ser.	Em.	Whoelbase	Axle	Fr.	Rear	Fr.	Rear
Spl	· .	• • • • • • •	Pric		Amid	Chain	Rad, Rd	Dead	Int		90	I-b'm	Cross	E11	36x1	36x1
Spl	Cone	Therm L. & S	Select.	3	Jacksh Amid	Chain Shaft	Tor. Rod	Dead Semi-float g.	Int' Ext	Înt	103 120	Solid I-b'm	Ell.	EII.	32x3} 34x4	
Porced	M. Disc	Steel	Select.	4	Amid			Ploating	1	Int.	126	I-b'm	•	ı	36x4}	i
Porced	M.Disc	Steel	Select.	3	U. Mo	Shaft		Ploating	Ext	Int	122	I-b'm	} E11	En.	36x4	36x4
Spl		R. & S.	I	3	Amid		T. R. & S	Ploating	1	Int	125	I-b'm			36x4	36x4
Spl	M.Disc M.Disc	Steel Steel	Select. Select.	1	Amid	Shaft Shaft	Springs Springs	Semi-float'g. Semi-float'g.	Tran . Tran .		116	Channel Channel	E11	Eu.	34×4 34×4	34x4 34x4
	Cone	Leath'r.	Select	3	1			Floating			120	I-b'm		' '	i	36x3 j
Porced Porced	M. Disc	Steel Steel Steel	Select.	. 14	Amid	Shaft Shaft	Tor, Tube	Semi-float'g. Semi-float'g. Dead. Dead. Dead.	Ext	Int Int	127 137	I-b'm I-b'm I-b'm I-b'm I-b'm	1 E11	En.	36x4 34x4}	36x5
Forced Forced	M JASC	10000	IDCICCI.	4	Amid	Chain	Rad. Rd Rad. Rd	Dead Dead	Tran.	Int	124 129	I-b'm	Eii	i iii.	36x4 36x4	36x5
Forced Sal	M.Disc	Steel	Select.								139				36x5	36x5
Spl Spl	Cone	S. & B. L. & C.	Select	3	Amid	Shaft	Tor. Rod	Semi-float'g. Ploating			112	I-b'm I-b'm	E11	E11 ₹ E11.,	32x31 34x00	32x34 34x00
Spl		L. & I	1		Amid.:.		I .	Ploating	•	ı	1211	I-b'm	} E11	} Eu.'	00x41	00x4}
Porced Purced	Cone	Leath'r Leath'r	Select Select	3 3	R. Ax Amid	Shaft Shaft	Tor. Tube Rad. Rd	Semi-float'g. Floating	Bxt	Înt	120 120	I-b'm I-b'm	Ell	EII.	34×4 00×4	34x4 00x4
Forced	M.Disc	S. & B.	. Select	1		1	1	Semi-float'g.	1		112			Eu.		34x4
Spl	M. Disc	Steel Steel Steel	Select Select	3 3	Amid	Shaft	Rad. Rd	Ploating			112 120	Channel	En.	Eu	34×4	34×4
Spl	M.Disc	Steel	Select Select	.13	Amid	Shaft Shaft	Rad, Rd	Ploating Ploating Ploating Ploating			124	Channel I-b'm I-b'm I-b'm	嗣	EII	36x4 36x4 36x4	36x4 36x4
Spl	M.Disc	S. & R. S. & R.	Select	3 3	R. Ax.	Shaft	Tor. Tube.	Floating	1	1	116	I-b'm I-b'm			1 1	1
Spi	4	S. & K. A. & S.	. Select		R, Ax	Snart		Floating	1		,				36x44 36x44	
Spl	M.Disc	A. & S. A. & S.	Select Select	3 3	U. Mo	Shaft	Tor. Tube	Ploating Ploating Ploating	Ext	Int	124 128 142	I-b'm I-b'm I-b'm	<i>테</i>	Plat.	34x4 36x44 36x4	34x4 37x5
Spl					1		Rad. Rd Rad. Rd								33x4	
Spl. Forced	Cone	Ļ. & į.	Select	3 3	Amid	Shaft	Rad. Rd	Floating	Ext	Int	114 122	I-b'm I-b'm	Eu	Eii.	36x4 36x5	36x4 36x5
Forced Spl.	Cone	L. & I. L. & I. L. & I. L. & I. L. & I.	Select	3 3	Amid Amid	Shaft	Rad. Rd	Floating Floating Floating Floating	Ext	Int	122 130	I-b'm I-b'm I-b'm I-b'm I-b'm	Ell	EU.	36x41 37x51 37x51	36x44 37x5
Porce		Steel	Select		R. Ax.	Shaft	II .	Semi-float'g.			133					
Porceo	.i	A. & S.	Select	. 4	U. Mo	Shaft		Ploating	1		126	I-b'm∴. I-b'm…			34×44	_
3 pl.	M.Disc	S. & R.	. Select	. 3	U. Mo		T.T.& S	_	 		110	I-b'm			36x4}. 34x3}.	
Spl	1	C. & S.		1	Amid	Shaft	Tor. Tube.	Ploating	Ext	Int	134	I-b'm			36x41	
Spl	1	Leath'r	1.		Amid		ł	Ploating			118	I-b'm	EU	En.	36x4 3	36x4
Spl	1 1		Select	,				Semi-float'g.			100					30x3
Spl Spl Spl	M.Disc	S. & B. S. & B. S. & B.	Select Select	3 3	Amid Amid Amid	Shaft	Springs	Floating Floating	ExI	nt	115 118	I-b'm I-b'm	Ell	EII.	34x4 3 36x4 3	34x4 36x4
Spl	•	L. & S.					1 -	Floating				• • • • • • • • • • • • • • • • • • • •	EB	Eu.	30X49 3	50X4 §
Spl.				3	Amid.	Shaft		_				I-b'm			40x444	
Spl Spl	Cone	L & I L & I L & I	Select.	3	Amid	Shaft Shaft	Springs Springs	Semi-float'g. Semi-float'g. Floating	Ext Ext	Int Int	112	I-b'm I-b'm I-b'm	EII.	En.	34x343	4x3
Spl	61	L. & I L. & I		3 3	Amid	Shaft		Ploating				I-b'm I-b'm			- 1	
Spl			Select.	1		ı	Rad. Rd		Int	_					36x4 3	6x4
Spl	Cone		i					_		1		I-b'm	- 1	- 1	- 1	6x4
Spl Spl	Cone	:::::::	Select. Select. Select.	4	Amid Amid Amid	Shaft Shaft		Semi-float'g. Semi-float'g. Semi-float'g.	Ext	Int Int	120 120	I-b'm I-b'm I-b'm	Ĕij.	En 3	4x4 3 4x4 3 6x4 3	9X4 4X43 6X41
Spl	M. Disc	R. & S.	Select.	3	U. Mo	Shaft		Semi-float'g				Ī-b'm			0x3400	
Spl.	M. Disc	ì	Select.	4		Shaft	Rad. Rd	Ploating	Ext			l-b'm			6x4436	
Spl	Cone	L. & S L. & S	Select. Select	3	Amid	Shaft Shaft	Tor, Tube Tor, Tube	Semi-float'g. Ploating	Ext Int	Int	116 116	l-b'm}	EII E		4x34 34 5x4 35	
fibre			<u>'</u>			' '	& C. fabr			!	,			u 3.	3X4 35)X4

fibre and steel; F. & I., fibre and iron; Fa. & S., fabric and steel; I. & C., iron and cork; L. & I., leather and iron; L. & C., leather and cork; L. & A., leather and asbestos; R. & I., Raybestos and iron; S. & B., steel and bronze; S. & R., steel and Raybestos; S. & C., steel and cork; T. & I., Thermoid and iron; U.Mo., unit motion.

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Tabulated Detailed Specifications of 1912

						РО	WER PLANT			C00	LING		TI	LANSI	IISSION
MAKE.	Load Capacity.	Cylinders.	How Cast	Bore	Stroke	Power	Carburetion	Ignition	Lubrication	Circulation	Radiator	Clutch	Form	Speeds	Location

Half-Ton and Less.

New Era*	400	1	1	3.6	13.7	1 6.0	Offloat Feed	Delco	Splash	Air		Band	iPlan	1 2	With Motor
Maxim*	500	2	Sep	3.2	14.5	8.	5 Own	Magneto	Splash	A1r			Hydrau .	l	With Motor
Reo	500	1		4.7	6.0	112.0	0 Own	Jump Spark	Force Peed	Thermo .		Disc	Plan	2	With Motor
Auburn	600	2	Sep	4.1			6 Float Feed	Jump Spark	Force Feed	Thermo	H'comb		Plan	Ιž	Amidships
Brush	600	1		4.0	15.0	110.0	0 Kingston	Bosch	Force Feed	Air		Plate	Plan	I	With Motor
Duryea	600	2	Sep	3.7			0 Heitger		With Fuel				Roller	1	C. S
Kearns	600	3	Sep	4.0			0 Schebler						Priction.	1	Anudships
Best	800	2	Sep	4.5	4.5		0 Kingston		Pump	Thermo	F. Tube		Friction.	1	Amidship
Chicago Bus	800	2	Sep	4.1	4.0	114.	O Float Feed		Sol. & Pump				Friction.	1	
Detroit	800	2	Sep	4.0	4.0		O Float Feed		Force Feed		Tubular	Disc	Plan	2	At Jackshaft.
Lincoln	800	2	Block	4 1			0 Schebler	Jump Spark					Priction.	1 -	ne jucksmare.
McIntyre	800	2	Sep	4. i	3.7		6 Float Feed	Jump Spark			Tubular.		Plan		With lacksh.
Overland	800	1	Sep	4.0	4 5		0 Schebler	Splitdorf	Force Feed		Tubular.		Select	1 3	Rear Axle
Acorn	1.000	ż	Sep	5.0	4.0		0 Schebler	Jump Spark			Tubular.		Friction.	١ ٠.	Amidship
Beyster	1,000	4	Block	3.5			O Float Feed		Solash		H'comb	Plate	Plan	2	Amidship
Blacker	1.000	l ż	Sep	4.0	4.0	13.	0 Schebler		Splash	Air		Band	Select	1 2	Amidship
Board	1,000	4	Block	3.7				Bosch				Cone	Select	1 3	Back Motor
Buick	1.000	2	Sep	3.5	5.0	22	0 Schebler	Remy	Force Feed		Tubular.		Plan	1 2	With Motor.
Champion	1,000	Ā	Pairs	4.2	15.0		0 Float Feed	Simms	Force Feed	Pump	Tubular.	Disc	Select	1 3	Amidship
Cino	1,000	4	Pairs	4.3	5.0	140	0 Stromberg	Remy	Spl. & Pump	Pump	Tubular.	M Disc		1 3	Amidship
Economy	1,000	2	Sep	4.5	5.0	20.	0 Schebler	Magneto	Porce Feed	Pump	H comb.	Cone	Plan	l ž	Amidship
Geneva	1,000	2	Sep	5.2	14.5	20.		Bosch	Force Feed		Tubular.		Plan		With Jacksh.
Gleason	1,000	2	Sep	4.0	4.7	20.	0 Schebler	Remy	Force Feed.		Tubular.	Disc	Select	1 3	Amidship
Hatfield	1,000	31	Sec	4.1	4.0	20.	0 Holley	Bosch					Friction.	1	
International	1,000	2	Sep	5.0	4.0	114.	0 Schebler	Bosch				Band	Pat	2	Back Motor.
Jonz	1,000	3	Sep	3.7	4.2	22.	0 Schebler	Bosch	Force Feed	Pump	H'comb	Plate	Select	3	Rear Axle
Lambert	1,000	2	Sep	5.2	4.0	20.	0 Schebler	Remy	Pump		Vertical		Friction.	1	Amidship
Mercury	1,000	2	Sep	4.2			0 Own	Battery	Spl. & F. F.	Air		Plate	Plan		With Motor.
Merit	1,000	2	Sep	4.7	4.7	18.	0 Schebler	Jump Spark	Spl. & F. F.	Air		Disc	Friction.	1 4	Amidship
Modern B	1,000	4	Block	3.7			0 Ploat	Eisemann	Spl. & F. F.	Pump		Cone	Select	1 3	Amidship
Regal LB	1,000	4	Pairs	4.1	4.0	30.	0 Ploat	Michigan	Spl. & Pump	Thermo.	Tubular.	Cone	Select	1 3	Rear Axie
Rogers	1,000	2	Sep	4.7	4.0		0 Kingston	Bosch	Force Feed.	Air			Friction.	l	Amidship
Schmidt	1,000	2	Sep	4.7			0 Schebler	Simms	Sol. & P. F.	Air		Disc	Plan	2	With Motor.
Sullivan	1,000	2	Sep	4.5	4.5	18.	0 Schebler	Bosch	Force Feed	Thermo.	Tubular.	Cone	Plan	ž	With Motor.
Van Dyke	1,000	2	Sep	4.5			0 Schebler		Mechanical	Pump	Tubular.		Friction.	1	Amidship
Warren	1,000	4	Block	4.0	14.5	130.	OFloat Feed	Bosch	ISpl. & Pump	Pump	lTubular.	ICone	Select	1 3	Amidship

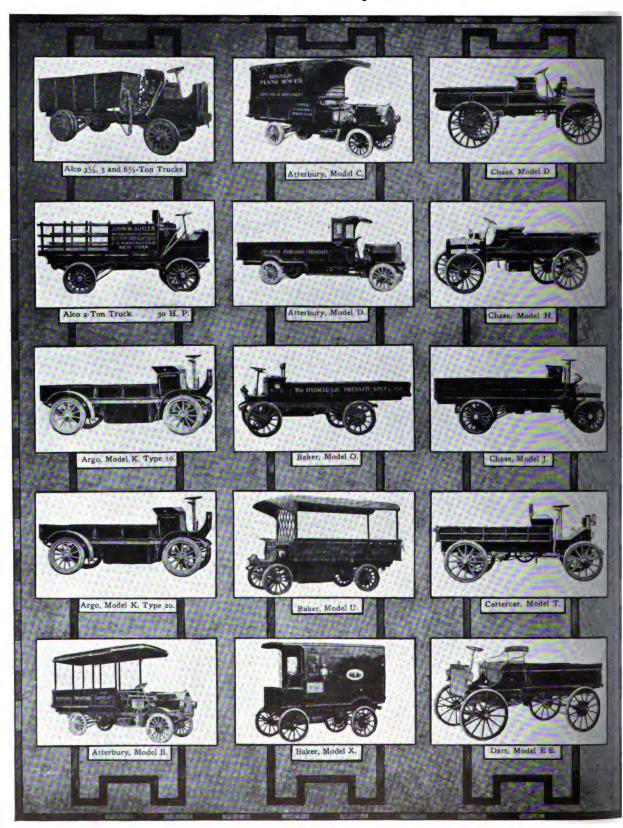
Half-Ton to One Ton.

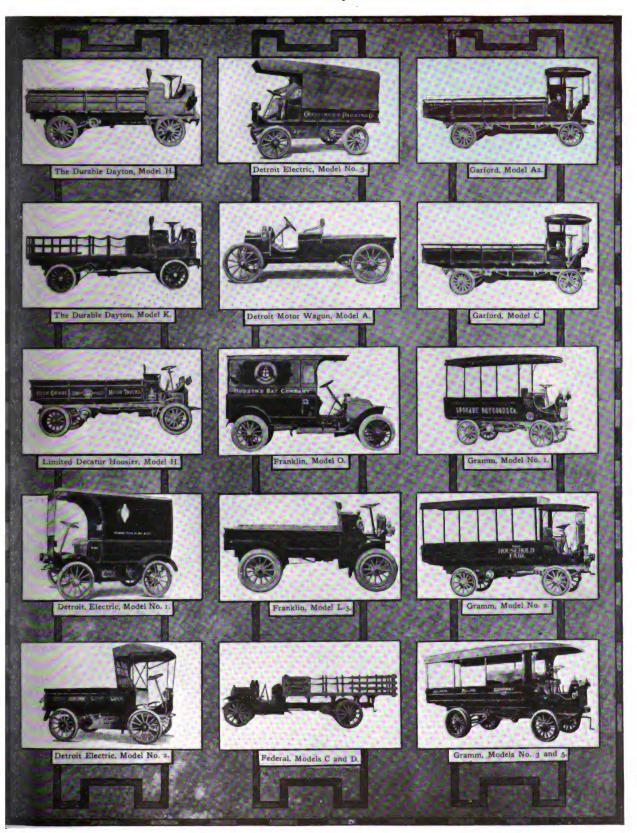
Auburn	1,200	2 Sep	1 4.7	14.7	120.	OfFloat Feed	(Remy	Force Feed.	Air,	I	1	IPlan1	2 With Motor.
Siebert	1.250	2 Sep	5.0			O Carter	Simms	Splash	Thermo	Tubular.	Plate	Plan	2 With Jacksh
Atlas		2 Pairs	4.5			O Float Feed	Atw't r-Kent.		Pump	H'comb.	Plate		3 With Motor.
Cartercar		2 Sep	4.5	15.0	18	O Schebler	Remy	Mechanical	Thermo	Tubular.		Priction	Amidship
Chase D	1.500	31 Sep	4.1			0 Holley	Bosch.	With Fuel	Air			Plan	2 With Jacksh
Coleman	1.500	21 Sep	4.5			Ploat Feed	I. W	With Fuel	Pump		Plate	Select	2 Amidship
Cortland	1.500	2 Sep	4.2	4.2	16	0 Breeze	Remy	Force Feed	Thermo	Tubular.	Cone	Plan	2 Amidship
Crown	1.500	4 Sep	3.7			O Schebler	Remy	Mechanical.	Thermo.	Tubular.	M. Disc.	Select	3 Anndship
Dart	1.500	2 Sep	4.2	1 5.0		Float Feed	Splitdorf	Force Feed	Thermo	H'comb.	Disc	Pian	2 With Motor.
Denniston	1.500	2 Block	4.0	4.7		OFloat Feed	Bosch	Spl. & Pump		H'comb.	Plate	Select	3 With Motor.
aylord	1.500	4 Pairs	4.0	5.0		O Schebler	Remy	Force Feed .	Pump	Tubular.	Disc	Select	3 Rear Axle
deal	1.500	4 Pairs	3.5		24	Float Feed	Bosch	Spl. & P. P.	Thermo	Tubular.	D. & C		3 With Jacksh
ohnson	1.500	4 Pairs	4.5	5.2	40 7	Stromberg	Optional	Splach	Pump	H'comb.	Cone		3 Amidship
Cearns		31 Sep	4.0			O Schebler	Unisparker	With Fuel	Air			Priction.	
Kisselkar	1.500	4 Pairs	4.2	4.2		Stromberg	Bosch	Splash	Pump	H'comb.			3 Amidship
incoln	1,500	2 Block	4.1	4.0		Schebler	Jump Spark.	Force Feed.	Air	la comb.	Cone	Priction	Jamiesmp
ippard-Stewart	1.500	4 Block	3.3		20	Ploat Feed	Bosch	Pump	Thermo.	H'comb.	Plate	Select	3 Amidship
fcIntyre	1.500	2 Sep	5.2	4.0	22.	5 Float Feed	Briggs	Solach	Thermo	Tubular.	Disc	Plan	2 With Jacksh
faytag-Mason	1.500	2 Sep	5.0			O Schebler	Jump Spark.	Splash	C. Pump.	Vertical.	Cone		
denominee	1,500	4 Pairs	4.7			0 Schebler	Eisemann	Pump	Pump	Tubular.	Disc	Select	3 With Motor
dodern	1.500	4 Block	4.3	5.0	30	O Float Feed	Jump Spark	Sol. & F. F.	Pump	I dodiai.	Cone	Select	3 With Jacksh
Ionitor	1.500	4 Sep	3.0			0 Schebler	Dual	Force Peed	Pump	H'comb.	Cone	Plan	2 Amidship
fora	1.500	2 Sep	4.5			Float Feed	Magneto	Force Feed		H'comb.	Disc	Plan	2 With Jacksh
Diver	1.500	2 Sep	5.0			Float Feed	Mea	Force Feed	Thermo.	Tubular.	Disc	Plan	2 With Motor
hiladelphia	1.500	4 Pairs	3.6			O Schebler	Bosch	Colorb	Pump	Lubulai.	Plate		3 Amidship
H P	1.500	4 Block	4.0			Float Feed.	Splitdorf	Spl. & F. F.	Pump	Tubular.	Disc	Select	3 With Motor
Reo	1.500	i Dick	4.7			O Own	Jump Spark	Spl. & F. F.	Thermo	H'comb	Disc	Plan	2 With Motor
ampson	1.500	2 Sep	4.7	4.7		Ploat Feed	Tump Spark.	Spl & F. F	Thermo.	Tubular.	Plate	Select	3 Amidship
chacht	1.500	4 Block	4.3	5.0		O Schebler	Mca	Spl. & Pump	I'mmp	H'comb.	Cone	Select	3 Amidship
ullivan	1.500	2 Sep	4.5	4.5		Schebler	Jump Spark.	Force Feed	Thermo.	Vertical.	Cone	Plan	2 With Motor
eerac	1.500	2 Sep	4.6			Holley.	Tump Spark.	With Fuel	Air	V CI LICAL.	Disc	Plan	2 With Jacksh
ictor	1.500	4	3.7			O Schebler	Bosch	Spl & F F	Pump	H'comb.	Disc	Select	
Webster	1.500	2 Block	4.5			OSchebler	Doscii	Force Feed	Air	IL COMO.	Disc	Plan	2 Amidship
White	1.500	A Block	3.7			O Own	Bosch	Spl & F F	Pump	H'comb.	Cone	Select	4 Amidship
Whitesides	1.500	4 Block	4.5	4.5		Marvel	Splitdorf	Splach	Thermo.	H'comb.	Disc	Plan	2 Amidship
Willet	1.500	31 Sep	4.5	4.5	30 6	Float Feed	Mea	Force Feed	Thermo.	comp	Plate	Select	3 Amidship
dams	2.000	4 Block	3.8			Kingston	Eisemann	Sol. & P F	Pump	Tubular.	Disc	Select	3 Amidship
tterbury	2.000	4 Block	4 0			6 Schebler	Bosch	Spl & P F	Pump	Tubular.	Plate	Select	3 With Motor.
essemer		4 Block	4.7			Stromberg	Bosch	Force Feed	Thermo	Tubular.	Cone	Select	3 With Jacksh
Blacker	2.000	Pairs	Lii			Special.	Bosch	Splash	Pump	a doublet.	Band	Select	3 Amidship
Board		4 Block	l i i	5 2		Schebler	Bosch	Force Feed	Pump	H'comb.	Disc	Select	3 With Jacksh
ass		Block	1 1 6	4 5	10 0		Bosch	Pump	Thermo	ri como	Cone	63.51.0	2 Amidship
hase	2,000	31 Sep	1.1			Float Feed	Bosch	With Fuel	Air		Cone	Select	
lark		2 Sep	5.0			Schebler	U. & H	Force Feed	Thermo.		Cone	Slid	3 With Jacksh 2 Amidship
Clark		1 Block	3.7			Float Feed		Purce Feed	Therino	H count	Dist.	Select	
Decatur	2.000	1 Sep	1 1 6	16%	lin i	Float Feed	C. man	L'oree Lee	Pump	III comb.		Select	3 Amidship
		7 10/0//	,	,	11.7	m mut reed	19, mms		retirity		HZTSC	iperect . * 1	3 Amidship

^{*}Tricar. † Pulls 3 tons on Trailer. † Two-cycle ** Four Wheel Drive. †† Front Drive. a To 740

Standard Gasoline Commercial Vehicles.

-	т	TRES		SPR	LNGS		BRA	KES		во	DY								
Final Drive	Front	kear	Front Azie	Front	Rear	Steering	Emergency	Service	Frame	Length	Width	Overall Length	Overall Width	Wheelbase	Tread	Chassis Weight	Maximum Speed	Seat Location.	List Price.
			·			Н	alf-7	Con	and Less										
Ch. Ch. Ch. Roller. Chs. Chs. Chs. Chs. Chs. Chs. Chs. Chs	28x2 . 5 30x3 . 3 34x1 . 3 36x1 . 3 36x1 . 3 32x2 . 3 38x2 . 3 32x2 . 3 34x2 . 5 34x2 . 5 36x3 . 3 34x4 . 3 36x3 . 3 34x2 . 5 36x3 . 3 34x2 .	28x2 5. 29x3 5. 30x3 3. 314x1 3. 314x1 3. 316x1 5. 316x2 5. 32x2 5. 33x2 3. 32x2 5. 33x2 3. 32x3 3. 34x3 3. 36x2 5. 36x2 7. 37x3 3. 38x2 3. 38x3 3. 38x2 3. 38x3 3. 38x2 3. 38x3 3. 38	Tubular Forged Wood D, Forged Channel Square Square Square Tubular L-beam Tubular L-beam Square Solid L-beam Square Solid L-beam Square L-beam Square L-beam Square L-beam L-beam L-beam Square L-beam L-bea	EII Full-eII J-ed. J-ed. J-ed. J-ed. Full-eII Semi-eII Semi-eII Semi-eII Semi-eII Semi-eII Semi-eII Semi-eII Full-eII Semi-eII Semi-eII Semi-eII Full-eII Semi-eII	Round. Round. Pull-eil. Semi-eil. Pull-eil. Semi-eil.	Own Ross Col Gemmer. Gemmer	Rever. Hubs. Hubs. Hubs. Rever. Rever. Hubs. Exp. Hubs. Cont. J. S. Cont. Hubs. Hubs. Hubs. Hubs. Hubs. Trans. Hubs. Hubs. Rever Trans. Hubs. Hubs.	Hub. Hubs. Hubs. Trans. Rever. Hubs. Lubs. Lubs. Lubs. Lubs. Lubs. Lubs. Hubs.	Fressed Steel Thublar Steel. AngleSteel. Wood Steel Angle Steel Angle Steel Angle Steel Angle Steel Angle Steel Pressed Steel Channel Steel Channel Steel Channel Steel Channel Steel Channel Steel Channel Steel Channel Steel Channel Steel Channel Steel Angle Steel Channel Steel Channel Steel Angle Steel Angle Steel Wood Pressed Steel Angle Steel Wood Pressed Steel Angle Steel Channel Steel Channel Steel Channel Steel Channel Steel Channel Steel Pressed Steel Pressed Steel Pressed Steel Pressed Steel Pressed Steel Pressed Steel Pressed Steel Pressed Steel		_	1116 125 103 121 126 1126 1126 1132 1144 1146 1136 1100 1108 1108 1108 1108 1108 1108 110	58 55 56 64 65 65 67 70 68 66 64 66 69 69 63 68 69	72 90 78-78-77 88-84 1000 96-100 96-100 96-1100 96-	50 477 56 56 56 56 56 56 56 56 56 56 56 56 56	450 600 1,100 1,100 1,375 8,255 1,700 1,700 1,200 1,200 1,300 1,300 2,200 4,000 1,915 1,400 1,500 2,200 1,500 1,500 2,200 1,500	35 25 20 16 24 20 30 18 25 25 20 20 20 20 20 20 20 20 20 20 20 20 20	Above Behind Above Above Behind Above Behind Above Behind Above Behind Above Behind Above Behind Behind Above Behind	\$ 425 395 600 685 487 500 900 610a 575 650 900 1,375 1,000 1,050 850 1,050 850 1,05
Chs. Shaft. Chs. Chs. Chs. Chs. Chs. Chs. Chs. Chs	36x2, 32x4, 34x2, 36x2, 36x2, x2, 36x2, x3, 36x2, x1, 32x4, 36x2, x1, 32x4, 32		Tubular I-beam Square Square I-beam I-beam Square I-beam I-beam I-beam Square I-beam I-beam Square I-beam Square I-beam Square I-beam I	Semi-ell. Full-ell. Semi-ell. Full-ell. Semi-ell. Full-ell. Semi-ell. Full-ell. Semi-ell.	Semi-ell. j-Platf. Full-ell. J-ell. Full-ell. Full-ell. Semi-ell. Semi-ell. Semi-ell. Semi-ell. Semi-ell. Semi-ell. Full-ell. Full-ell. J-ell. Own. W & S Own. Gemmer Own. Gemmer Own. Gemser Gemse	Rever I. S.	Hubs. J. S. Trans. Trans. L. S. Trans. L. S. Trans. L. S. Trans. L. S. L	Angle Steel. Angle Steel. Angle Steel. Pressed Steel Pressed Steel Wood. Angle Steel Wood. Angle Steel Wood Nickel Steel Steel Pressed Steel Wood Thannel Steel Pressed Steel Wood Thannel Steel Wood Thannel Steel Pressed Steel Nood & Steel Pressed Steel	150 84 106 96 80 96 90 82 96 108	41 42 35 50 40 46 48 48 64 44 45 48	132 170 200 160 183 192 156	40 77 70 64 62 72 75	105	56 56 56 56 56 56 50 56 56 56 56 56 56	1,800 1,900 1,800 2,000 2,000 2,100 1,700 2,000 2,100 1,350 2,000 2,000 2,500 2,250	18 18 20 30 17 15 20 18 12 18 16 15	Above Behind Above Behind Above Behind Above Above Above Behind Above Behind Above Behind Above Behind Above Behind Above Behind Above Behind Above Behind Above Behind Behind Above Behind Behind Above Behind Behind Above Behind Behind Above Behind Above Above Above Above Above Above Above Above	750 1.000 1.750 1.250 900 1.250 970 1.200 650 2.000 1.500 1.	



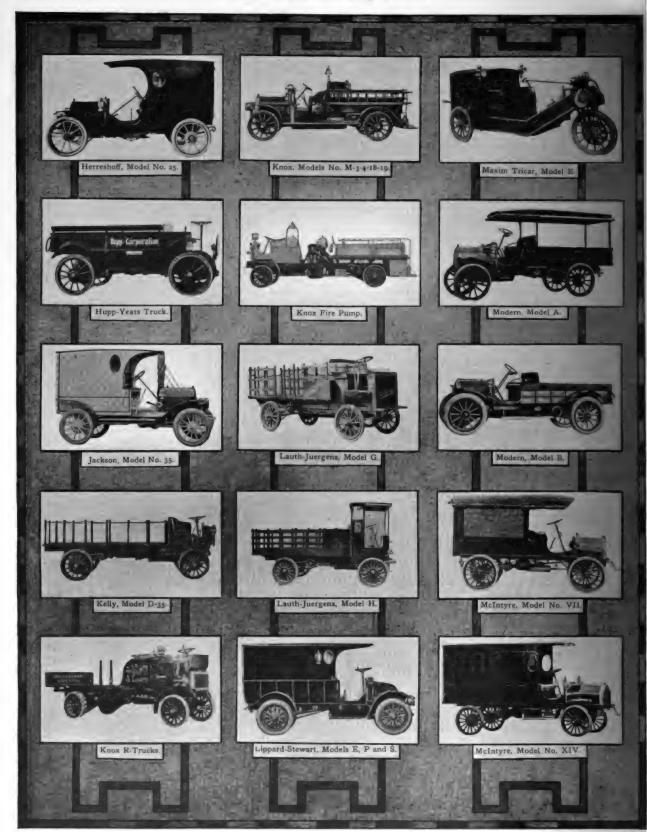


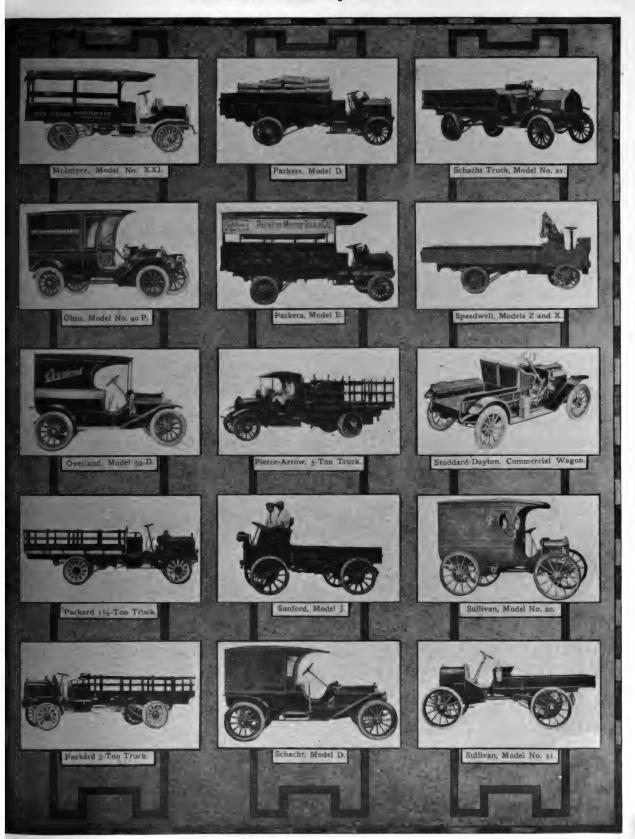
Tabulated Detailed Specifications of 1
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					-	F	POWER PLAN	Т		coc	DLING		TF	LANS	MISSION
MAKE.	Load Capacity.	Cylinders.	How Cast	Bore	Stroke	Power	Carburetion	Ignition	Lubrication	Circulation	Radiator	Clutch	Form	Speeds	Location
Dominion Federal. Federal. Franklin Garford. G-M-C. Grabowsky Gramm. Haffedd Haffedd Indiana Kisselkar Lambert. Lauth-juergens. Little Giant. McIntyre. Mack Maytag-Mason Monitor. Nonitor. Pl-H-P Plymouth Rassel Sanford Schmidt Service Siebert Siegeman Tractor! Utility Victor Westman Whitesides	2,000 2,000	444444344444444444444444444444444444444	Block Pairs Sep Block Block Block Block Sep Sep Sep Sep Sep Sep Sep Block Sep Sep Sep Sep Block Block Sep Sep Sep Sep Block Block Sep Sep Sep Sep Block Block Block Sep Block	4.1 4.5 3.3 4.0 3.5 4.0 4.1 4.1 4.1 4.1 4.1 4.1 4.5 5.0 4.0 5.2 4.0 5.2 4.0 4.0 5.2 4.0 4.0 4.0 4.0 5.2 4.0 4.0 4.0 4.0 5.2 4.0 4.0 5.2 4.0 5.2 4.0 4.0 5.2 4.0 5.2 5.2 5.2 5.2 5.2 5.2 5.2 5.2 5.2 5.2	4.53 4.03 5.22 4.03 5.22 4.03 5.22 4.03 6.73 5.00 4.73 5.00 4.73 5.00 4.73 5.00 4.73 5.00 4.73 5.00 4.73 5.00 4.73 5.00 4.73 5.00 6.73 6.73 6.73 6.73 6.73 6.73 6.73 6.73	30.0 (20.0) (22.0) (20.	Stromberg. Schebler Schebler Schebler Schebler Float Feed Stromberg Schebler Float Feed Float Feed Float Feed Schebler Float Feed Schebler Float Feed Schebler Float Feed Schebler Float Feed Schebler Float Feed Schebler Float Feed Schebler Float Feed Schebler Float Feed Schebler Float Feed Schebler Float Feed Schebler Float Feed Float Feed	Magneto Bosch Bosch Bosch Bosch Bosch Bosch Bosch Bosch Bosch Bosch Bosch Jump Spark Bosch Jump Spark Splittlorf Splittlorf Splittlorf Bosch Jump Spark	Splash Spl. & F. F. Splash Spl. & F. F. Splash	Thermo. Pump Air. Pump Pump Pump Pump Thermo	Tubular, Tub	Cone Cone Disc. Disc. Disc. Disc. Cone Disc. Disc. Cone Cone Cone Cone Cone Cone Cone Cone	Select. Select. Select. Select. Friction. Select. Friction. Select. Se	nas toss nat sees tosses nate as nase	With Jacksh Amidship Amidship Amidship Amidship Amidship Amidship Amidship Amidship With Jacksh With Jacksh With Jacksh With Jacksh With Jacksh With Jacksh With Jacksh With Jacksh With Jacksh With Jacksh With Jacksh With Jacksh With Motor With Motor Amidship Amids
Brandon**. Cortland Eclipse Eclipse American Eagle American Eagle Autocar Blair Chase Cortland Decatur Dynamic Garford Grabowsky Hart-Kraft Ideal Johnson Grabowsky Sampson Sandusky Sternberg Sampson Sternberg Satter Velie Westman1†	2,500 2,500 3,000	442432444444444444444444444444444444444	Block Pairs Pairs Pairs	4.5 5.0 4.0 4.7 4.1 4.5 5.0 4.7 4.1 4.1 4.1 4.1 4.1 4.1 4.1 4.1 4.1 4.1	4.00 4.52 0.00 2.52 2.57 2.00 0.02 0.02 0.02 0.02 0.02 0.02 0.0	45.0 22.0 30.0 25.6 18.0 30.0	Schebler Float Feed Stromberg Stromberg Stromberg Schebler Float Feed Schebler Float Feed Schebler Float Feed Schebler Float Feed Stromberg Float Feed Stromberg Float Feed Stromberg Float Feed Stromberg Float Feed Stromberg Float Feed Stromberg Float Feed Stromberg Float Feed Stromberg Float Feed Float Feed Float Feed Stromberg Float Feed Float Float Float Float Float Float Float Float Bosch Bosch Jump Spark Kemv Smins Magneto Bosch Bosch Bosch Bosch Bosch Jump Spark Lisemann Magneto Lisemann Mea Liump Spark Mea Lisemann	Porce Feed Porce Feed	Pump Avr. Thermo. Pump Pump Pump Pump Pump Pump Thermo. Thermo. Thermo. Thermo. Pump Pump Thermo. Thermo. Thermo.	H comb. Tubular. H comb. Tubular. H comb. H comb. Tubular. Tubular. Tubular. Tubular. Tubular.	Cone Cone Plate Cone Cone Disc Cone Disc Cone Disc Cone Cone Cone Cone Cone Cone	Select Plan Select Prog Select Prog Select Plan Select	233333323243333222333333333	With Axles Amidship Amidship Amidship Amidship Amidship Amidship Amidship Amidship Amidship Amidship Amidship Amidship Amidship With Jacksh Amidship Amidship With Jacksh Amidship With Jacksh Amidship With Jacksh Amidship With Motor Amidship Amidship Amidship Amidship Amidship Amidship Amidship Amidship Amidship Amidship Amidship Amidship Amidship	
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Tabulated Detailed Specifications of 1912

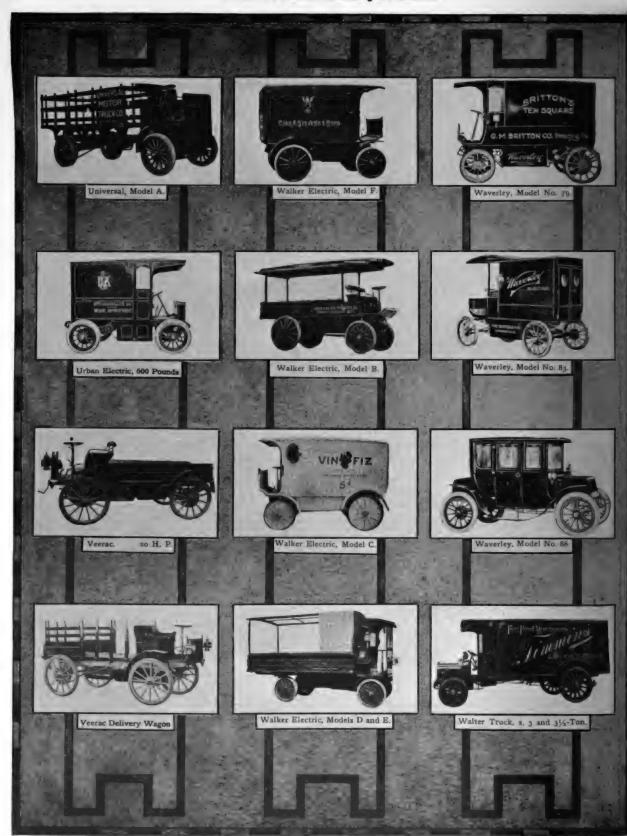
				_		P	OWER PLANT	:		coo	LING		TRANSMISSION				
MAKE.	Lond Capacity.	Cylinders.	How Cast	Bore	Stroke	Power	Carburetion	Ignition	Lubrication	Circulation	Radiator	Clutch	Form	Speeds	Location		
& S ictor /alter	4,000 4,000 4,000	1 1	Sep Sep Pairs	4.7 4.1 4.0	5.0	36 (40 (30 0	Schebler Schebler Stromberg	Eisemann Bosch	Spl. & F. F., Spl. & F. F. Force Feed	Pump Pump. Pump	Vertical H'comb H'comb	Cone Opt	Select Select .	3 3	Amidship.		
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ikco -M-C Reliance .nickerbocker rackers Valter commer .cclipse .nox eerless aurer peed wall tegeman ternberg	7,000 7,000 7,000 7,000 7,000 8,000 8,000 8,000 8,000 8,000 8,000 8,000 8,000	4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4	Pairs. Pairs. Pairs. Pairs. Pairs. Pairs. Pairs. Pairs. Pairs. Pairs. Pairs. Pairs. Pairs. Pairs. Pairs.	5.0 5.5 4.5 5.2 4.0 4.3 4.5 5.0 4.5 4.3 5.0 4.5 5.2	5.5 5.0 5.0 5.5 4.7 6.5 5.5 5.5	40 35 50 30 45 40 40		Mea Bosch Splitdorf Bosch Bosch Bosch Bosch	Force Feed . Splash . Force Feed . Force Feed . Force Feed	C Pump G Pump C Pump C Pump Pump C Pump G Pump C Pump Pump	Tubular. Tubular. Tubular. Tubular. Tubular. Tubular. Tubular. H'comb.	Disc Cone Disc Exp Cone. Cone Cone Cone Cone Cone Cone Cone Cone	Select Prog. Select Sel	3 3 3 3 3 3 4 4 3	Amidship With Jack Amidship With Jack With Jack Amidship With Jack With Jack Amidship Amidship Amidship Amidship		
\lco	10,000		Pair	1 5.0	6.0	140.0	Newcomb	(Bosch	Spl. & F. F.:	. C.Pump	H'comb.		Select	.3	Amidship.		
American Jarker DeDion Jargenau Jarford J-M-C Jrabowsky Jramm Hewitt Johnson Kissel-Kar Knickerbocker Knox Kopp Jocomobile Jozier Mack Moeller Morgan	10, 000 10, 000	4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4	Sep Pairs Sep Pairs Pairs Pairs Pairs Pairs Pairs Pairs Pairs Sep Sep Pairs Pairs Pairs Pairs Pairs Pairs Pairs Pairs Pairs Pairs Bears Pairs Sep Block	5.2 5.0 4.7 4.1 4.2 5.0 5.2 5.0 4.7 5.5 5.0 4.7 5.5 5.0 4.7 5.5 5.0 4.7 5.5 5.0 4.7 5.5 5.0 4.7 5.0 5.0 6.0 6.0 6.0 6.0 6.0 6.0 6.0 6.0 6.0 6	4.7 5.5 5.9 5.0 5.0 6.5 6.5 6.5 6.5 6.5 6.5 6.5 6.5	40 35 30 40 44 40 50 40 48 60 45 35 18	0 Mayer. 0 Own. 0 Float Feed. 0 Float Feed. 0 Schebler. 1 Float Feed. 2 Rayfield. 0 Own. 0 Stromberg.	Bosch Bosch Mea Bosch Optional Bosch Optional Bosch Bosch Bosch Bosch Bosch Bosch Bosch Bosch Bosch Bosch Bosch Bosch Bosch Bosch Bosch Bosch Bosch Bosch	Splash Splash Force Feed Spl & F F. Splash	Pump Pump C Pump Pump Pump Pump Pump Pump Pump	Tubular Tubular Tubular Tubular Tubular H'comb. H'comb. H'comb. H'comb. H'comb. H'comb. H'comb. Tubular H'comb Tubular Tubular Tubular Tubular Tubular Tubular Tubular Tubular Tubular Tubular H'comb	Cone Disc Disc Disc Cone Cone Cone Cone I'late Disc Disc Cone Cone Cone Cone Cone Cone Cone Cone	Plan Select Select Select Select Prog Select Prog Select	423453344	Amidship. Amidship. Amidship. Amidship. With Jack With Mote Amidship. Amidship. Amidship. Amidship. Amidship. Amidship. Amidship. Amidship. Amidship. With Jack Amidship. With Mote Amidship. With Mote Amidship. Amidship. Amidship. Amidship. Amidship. Amidship. Amidship. Amidship. Amidship. Amidship. Amidship.		



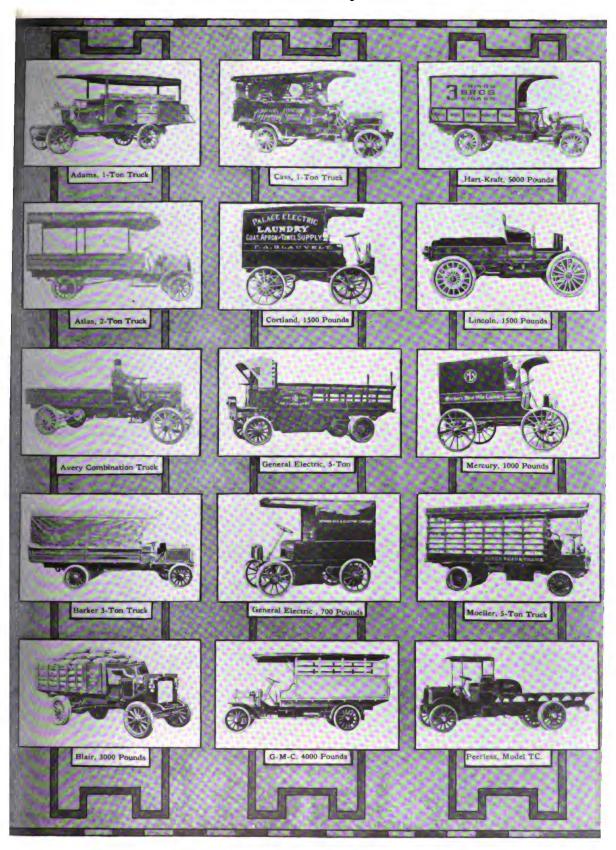
THE AUTOMOBILE JOURNAL.



-		d Gaso	<u> </u>		INGS	1	r	KES	1	-		-			1	<u> </u>	1	1	
Final Drive	Front		Front Azle	Front	Rear	Steering	Emergency	Service	Frame	Length	Width	Overall Length	Overall Width	Wheelbase	Tread	Chassis Weight.	Maximum Speed	Seat Location.	List Price.
16 15	32x4 36x4	34x5 36x3D 36x5 or 6	I-beam I-beam	Semi-ell Semi-ell Semi ell	Platf Semi-ell. Platf	Ross Worm	Hubs Hubs Hubs	I.S.	Channel Steel Channel Steel Channel Steel	138	51			125 140 124	62 66 58	3,900	12	Above Behind,	2,900
						Tw	o T	ons	to Thre	e 7	Con	s.							
Min. Service of the s		Rect. S. D.	Double Libeam Libeam Square Square Libeam Libeam Square Square Square Square Libeam Li	Some di Some ell. Some ell.	Seria ell Platí Semi ell Semi ell Semi ell Platí Platí Semi ell Platí Semi ell Platí Semi ell	Genmer W&N. Own. Own. Own. Own. Own. Own. Own. Own	Shaft. Hubs. Hubs. J.S. Hubs.	Shaft Hubs Shaft Pressel Steel, Wrood & Steel, Nickel Steel, Nickel Steel, Nickel Steel, Channel S	138 120 144 148 168 169 169 169 169 169 169 169 169 169 169	72 76 72 60 64 60 60 72 72 72 72 72 72 72 72 72 72 72 72 72	144 216 218 74 188 2222 18 188 2222 216 2216 2216 2216	78 81 82 81 78 72	121 140 150 150 143 121 138 123 123 120 136 123 120 136 137 145 146 147 147 147 147 147 147 147 147 147 147	111 556 58 58 570 722 64 64 65 65 66 66 66 66 66 66 66 66 66 66 66	4 ,200 5 ,400 5 ,600 5 ,600 6 ,600 5 ,500 6 ,700 6 ,400 5 ,500 6 ,400 5 ,500 6 ,400 6 ,400 4 ,500 5 ,200 6 ,500 6 ,500	12 20 12 16 16 10 12 14 18 12 13 13 25 18 12 12 12 12 12 12 13 13 13 13 13 13 13 13 14 15 16 17 18 18 18 18 18 18 18 18 18 18 18 18 18	Side Behind Behind Behind Behind Behind Behind Behind Side Behind Above Above Above Above Above Above Above Above Above Above Above Above Above Above Above Above Above Above Behind Above Above Behind Above Above Behind Above Above Behind Above Above Behind Above Above Behind Above Above Behind Above Above Above Above Above Behind	3, 250 3, 000 3, 200 3, 200 3, 300 5, 000 5, 000 5, 000 5, 000 5, 000 3, 500 3,	
_			· · · · · · · · · · · · · · · · · · ·			Th	ree ´	Fons	s to Four			•						110011	4,000
5	10x3 10x5 10x5 10x5 10x5 10x6 10x6 10x6 10x6 10x6 10x6 10x6 10x6	42x5 1 54x4 7 1 36x4 1 36x6 1 42x5 1 42x5 1 37x5 1 40x5 1	I beam I	Sena ell Sena ell	Sena ell			Hubs	Channel Steel Channel Steel Channel Steel Channel Steel Channel Steel Channel Steel Channel Steel Channel Steel Channel Steel Channel Steel Will & Steel		78 56 72 78 72		72 73 80 88	126 138 116 150 154 132 144 149 151 153 115 155	68 65 66 62 62 62 62 69 64 64 68 68	5,500 6,500 5,200 6,000 4,400 5,100 5,300 7,000 6,900 5,700 6,000 7,500	11 15 13 18 20 20 12 12.3 13 12	Above Above Above Above Behind Above Above Behind Behind Above Above	3,050 3,500 3,500 3,400 5,500 4,000 5,000 3,500 3,950 3,500
	30 X 5	36×5D	D Forged Deam .	Sen t ell Sena ell	Secretil Platf		III di	I S	Charmel Steel . Worm & Steel	168 156	66	2 3 5	70 7	144	62	7,800	10	Above	4,750
G S S S S S S S S S S S S S S S S S S S	stock in the stock	100.4 1 100.4 1 100.5 1 100.	I beam I beam Forged Scaure I beam I beam D Forged I beam	Some ell Some som ell som el	Own Own Own Own Own Own Ross Own Own Own	1 S He be He be He be He be Hubs Hubs Hubs Hubs Hubs Hubs Hubs Hubs	DHAST	Channel Steel Wessel & Steel Steel Steel Steel Steel Steel Steel Control of the Steel Steel Control Steel Control Steel Control Steel Steel Steel Steel Steel Steel Channel Steel Channel Steel Locard Steel Channel Steel Channel Steel Channel Steel Channel Steel Channel Steel Channel Steel Channel Steel Channel Steel Channel Steel Channel Steel Channel Steel Channel Steel Channel Steel Steel Steel Steel Steel Steel Steel Channel Steel Physical Steel Physical Steel Physical Steel Physical Steel Channel Steel Channel Steel Ste	168 144 168 144 170 156 168 153 168 156 157 168 174 168	75 68 64 60 80 62 72 72 72 72 62	250 228 220 205 228 204 204 204 190 230 262 228 228 227 246 246	76 87 88 87 72 84 72 78 72 78	156 130 138 132 156 122 149 126 140 134 144 154 174 174	64 67 69 79 68 72 69 67 72 69 70 72 69 65 65 61 72	5 006 6 200 5 400 7 600 7 600 7 600 6 500 6 600 6 600 7 600 7 600 7 600 7 600 7 600 8 600 7 600 8 600	11 18 15 10 9 5 10 12 10 10 10 14 12 8 .5 13 10 10 10 10 10 11 11 11 11 11	Behind Behind Above. Above. Above. Above. Above. Above. Above. Above. Above. Above. Above. Above. Above. Above. Above. Above. Above. Above. Behind Above. Behind Above. Behind Above. Behind Above. Behind Above. Behind Above. Behind Above. Behind Above.	4,500 5,500 5,250 4,500 4,400 5,000 5,000 4,500 4,500 4,500 4,500 4,750 4,750 4,750 5,000 5,000	



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						PO	WER PLANT			COO	LING		ÍЯ	ANS	MISSION		
MAKE	Lond Capacity.	Cylinders.	How Cast	Bore	Stroke	Power	Carburetion	Lention	Lubrication	Circulation	Radiator	Chutch	Form	Speeds	Location		
itearns /ictor Walter	10,000 10,000 10,000	4	Sep Sep Pairs	4.7 5 2 4.5	6.0	160 0	Ploat Feed Schebler Stromberg	Bosch Bosch	Sol. & F. F	Pump Pump C Pump	H'comb.	Disc Disc Exp Cone	Select Select Select	3 3	Amidship With Jacks		
						110.10		Five T									
Commer B-O-E Gaggenau Knox Speedwell Stegeman Alco Commer Aries Hewitt Victor Remington Hewitt Moore Remington	11,000 12,000 12,000 12,000 12,000 13,000 13,000 14,000 14,000 14,000 15,000 20,000 20,000 20,000	4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4	Pairs Pairs Pairs Sep Pairs Pairs Pairs Pairs Pairs Pairs Pairs Pairs Pairs Pairs Pairs Pairs Pairs	4.7 5.4 5.3 5.5 5.0 5.0 4.7 5.0 4.2 5.0 4.8 5.7	8.0 5.9 5.5 5.0 6.0 5.5 5.7 6.0 6.0 6.0 6.0	45.0 48.0 40.0 45.0 40.0 40.0 60.0 38.0 45.0 38.0	Ploat Peed. Ploat Feed. Stromberg. Schebler. Stromberg. Newcomb Own. G. & A. Own Schebler Ploat Peed Own. Schebler Ploat Peed	Splitdorf Bosch Bosch Eisemann Briggs Bosch Bosch Bosch Bosch Bosch Bosch Bosch Bosch Bosch	Spl. & P. F Porce Feed Force Feed Spl. & F. F Spl. & P. F Pump	Thermo. Pump C. Pump Pump Pump Pump Pump Pump Pump Pump	Tubular Tubular Tubular H'comb H'comb Tubular Tubular Tubular H'comb H'comb	Disc Disc Plate Cone Disc Disc Disc Cone Opt Cone Cone	I. Cl. Select Select Select Select Select I. Cl. Select I. Cl. Select I. Cl. Plan Select Hydr Plan Select Hydr Select Hydr Select	3 4 3 3 3 3 3 2 3	Amidship. Amidship. Amidship. With Jacks Amidship. Amidship. Amidship. Amidship. Amidship. Amidship. Amidship. Amidship. Amidship.		
							Municip	al Wag	ons, Et	c.							
Beck 15 Passenger Franklin 5 Passenger. Great Eagle Ambulan Great Eagle Ambulan Knox Combination Ho Knox Chemical-Hose Luitwieler Pump. Victor 12 Passenger. Victor 20 Passenger. Victor 30 Passenger. Victor 30 Passenger.	e. e. se	4 4 6 6 4 4 4 4 4 4	Sep Sep Sep Sep Sep Sep Pairs. Sep Sep Sep	5.0 5.5 6.0 4.0	4.0 5.0 5.1 5.5 5.5 6.5 4.5	18 0 50 0 60 0 48 0 60 0 30 0	Float Feed Stromberg Stromberg Stromberg Stromberg Schebler	Bosch Remy Remy Bosch Bosch Dual	Splash Spl. & F. F G. F. G. F. Force Peed P. P. & Pump Porce Peed Spl. & F. F. Spl. & F. F. Spl. & F. F. Spl. & F. F. Spl. & F. F.	C.Pump.	H'comb H'comb Tubular Tubular	Disc Cone Cone Plate Plate Cone	Select Se	33333333	With Motor Amidship. Amidship. Amidship. With Jacks With Jacks Amidship. With Motor		

Tabulated Detailed Specifications of 1912

	ity.	BODY				Cap.			
MAKE.	Load Capacity.	Length Width	Weight	Battery	Battery Wt.	AmpHours Co	Motor	Motor Speed	Controller
Commercial	500 600			30 LD 11 Pl			GE-1,025 60 V 32 Amp		GE-S-103
General Vehicle	700	56 40	2.700	44 GV 9 Pl	835	104	1020 85 V 16 Amp	1.200	S-35-B
Studebaker	800	83 36		Optional					3-33-20,
Ward	800			42			Spec. Auto Type		Under Pront Seat
Argo	1,000	90 42	2,800	28 Ex 11 Pl			Westinghouse		o mier i rout beat.
Baker	1,000	80 40	2,200	42 Ex 9 Pl					
Commercial	1,000								
General Vehicle	1,000	72 41		44 11 Pl	1,255	138	1020-85 V 20 Amp	2 000	S. 15. R
Detroit	1,000	75 42		60 Edis. A-4			Type 17 70 V 30 Amp	1,300	14T
Urban	1,000	73 42		50 Edis. A4			GE-1025 60 V 32 Amp	1,300	OES 103
Beaver Studebaker	1,500	87 40 83 39		60 Edis, A6			One GE		
Argo	1,500			Optional					
Baker	2,000	100 42 90 42		28 Ex 13 Pl			Westinghouse		
Commercial.	2,000		-3,000	42 EX 9 Pl			3.5 Horsepower Service		a ser an and the
Detroit	2.000	80 48	3.400	60 Edis, A6			Type 17-70 V 30 Amp	1 100	
General Vehicle	2.000	96 48	4.700	44 13 Pl	1.485	142	1026-85 V 28 Amp	1,300	14T.
Lanaden	2.000	70 48		Edison	1.600	102	1020-83 V 28 Amp		S-35-B
Waverley	2.000	84 40	0,730	42 Ex 11 Pl	1,000		GE .		
Studebaker	2,500	115 43		Optional					
Waverley	2.500	156 54		42 Opt 11 Pl			2 GE		GE.
Detroit	3,000	100 54	4.840	60 Edis, A8			Type 18 70 V 48 Amp	1.120	19T
Lansden	3,000			Edison	1,600			1	1.01
Walker**	3,000	96 41	4,400	42 Ex 11 Pl		140	One 3 5 Horsepower 80 V		1
Baker	4,000	150 66	4,500	42 Ex 13 Pl			4 Horsepower Service		
Commercial	4,000	132 50		42 Ld 60 Edis			85 V 22 Amp,		Cont. Tor
General Vehicle	4,000	132 56	6,300	44 GV 17 P1	1,970	216	85 V 22 Amp	1.200	S-35-B
Lansden	4,000		4,900	Edison	1,600				
Studebaker	4,000	156 50		Optional					
Lansden	5,000		5,200	Edison	1,600				
Lansden	6.000		5,200	Edison	1,600				
Waverley	6,000	156 54	2 000	12 Opt. 15 Pl 42 Nat			One GE		GE
Commercial	7,000	156 60 156 58	7.500	42 Ld. 60 Edis			2 Westinghouse		
General Vehicle	7,000	154 60	8,500 9,500	44 GV 21 Pl	2.410	270	85 V 16 Amp		
Studebaker	7.000	157 56		Optional	2,410	470	1,022 85 V 40 Amp	1,200	S-35-B
	10.000	192 68	10,000	52 Ld 60 Edis			85 V 16 Amp.		C
	10.000	180 60		44 Ld 21 Pl			One in each wheel		Cont. Tor .
	10.000	180 72		44 GV 25 Pl	2.790	324	1,022 85 V 40 Amp		C of D
	0.000	169 59		Optional	6,170	364	1,022 83 V 402Amp	1,200	S-35-B.

TIRES		TTRES	tes		INGS	GS		AKES		BODY						jk		g	
Final Drive	Front	Rear	Front Axle	Front	Rear	Steering	Emergency	Service	Frame	Length	Width	Overall Length	Overall Width	Wheelbase	Tread	Chassis Weight	Maximum Speed	Seat Location	List Price.
hs hs hs	34x5 30x6 36x5	38x5D 38x5D 42x5D	I-beam I-beam	Semi-ell Semi-ell Semi-ell	Semi ell Semi ell Platf	Own Worm W & G	Hubs Hubs Hubs	J. S J. S Hubs.	Pressed Steel Channel Steel Channel Steel	144 144	72 72	228	84	144 146 154	63.5 70 62	5,000	15	Behind Behind	\$3.8 4.5
							O	er I	ive Tor	18.									
15 15 16 16 16 18 18 18 18 18 18 18 18 18 18 18 18 18 18 18 18	30x6 33x4 7 36x7 30x5.5 30x6 30x7 34x5.5 36x5.5 36x5.5 36x5 30x5.D 36x5 30x5.D	40x0 . D 37x5 5 . D 42x7 . D 36x5 5 . D 40x5 . D 42x6 . D 40x8 . St. 36x6 . D 40x8 . St. 36x6 . D 42x6 . D		Semi-ell Semi-ell Semi-ell Semi-ell Semi-ell Semi-ell Semi-ell Semi-ell Semi-ell Semi-ell	Semi ell Semi S & N Own Ross Ross Own W & G Own Own Own Own Own Own Ross Own	Hubs Hubs Hubs J. S Hubs Hubs Hubs Hubs Hubs Hubs Hubs Hubs		IChannel Steel Channel Steel Ch Nick St. Channel Steel Channel Steel Channel Steel Channel Steel Channel Steel Channel Steel Channel Steel Pressel Steel Pressel Steel Channel Steel Pressel Steel Channel Steel Channel Steel Channel Steel Channel Steel	150 168 168 168 180 150 168 144 180 144 180 192	60 75 84	264 226 252 260 235 264 270 240 246 246 246	84 70 86 40 84 85 69 94 88	144 154 178 149 139 156 164 144 156 138 146 162 138 135 162 158	70 68 66 74 65 68 70 70 8 72 61 68 65 61 72	6,600 7,600 8,800 5,900 6,800 9,960 9,600 12,000	15 10 12.5 11 9 10 9 14 10 8 	Behind Side Behind Side Above Behind Above Behind Hehind Side Above Above Above	0.50 6.00 5.00 4.00 5.00 6.00 6.00 6.00 6.00 6.00 6.00 6	
			•			Mu	ınici	ipal	Wagons	, E	tc.	•							
haft haft haft haft. hs hs	30x4. 36x4. 36x4. 40x5. 40x4. x4. 34x3. 36x4. 36x4.	36x4.5. 36x4.5. 40x5D 40x3.5D x5 34x4 36x3D	D Forged.	Semi-ell Semi-ell Semi-ell Semi-ell	Semi ell Semi ell Platf Semi ell Semi ell	Ross Own Own	Hubs Hubs	Trans Hubs Hubs J S J S J S J S J S	Channel Steel Wood Pressed Steel Pressed Steel Channel Steel Channel Steel Channel Steel Channel Steel Channel Steel Channel Steel Channel Steel Channel Steel	90 90 101	72 48 48 50	192	72	130 122 135 138 170 145 139 120 140 140	56 56 56 70.7 60 58 56 66 66	2,000 9,000 6 000	30 30 30 30 42	Behind Behind Behind Behind Above Behind Above	3.0
					N	lixed	Sys	tem	s, Gasoli	ne-	Ele	ecti	ric.						
lec hs			l berm .		Semi ell Semi ell	Own .	Elec Hubs	Whs.	Channel Steel I beam	168	72 80	302	78	144	1 66 77	9,000	12	Above .	5.

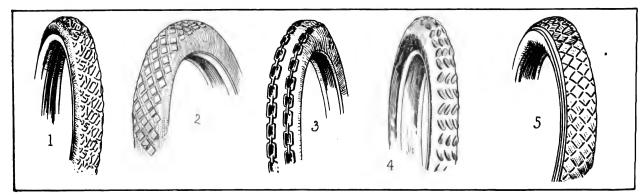
						AX	LES	TIR	RES	BRAE	ES	SPR	INGS		
Contr. Speeds	Wheelbase	Tread	Max, Speed	Mileage	Final Drive	Front	Roar	Front	Rear	Emergency	Service	Front	Rear	Frame	List Price.
Fwd 2 Rev Fwd 2 Rev	85 86	56	15	50	Worm	I beam	I-beam	36x2 5	34x2 5	2 prs		f-ell Semi-ell			\$1,80
Pwd. 2 Rev	7.1	5.3	12	15	Chs			32x2 5		Hubs		Semi-ell Platf	Semi-ell Full-ell	Channel Steel	
1	84	50	11 3	40	Chs	Tubular.	Tubular			Hubs		Full-ell.	4 Platf	Wood	1
	86	5.4	12	50)	Shalt	Tubular	Tubular			Ехр		Semi-ell.	Semi-ell	Channel Steel .	1.8
	8.5	50	1.1		Ch.	I-beam	Forged .	14x3	34x3	Exp		Semi-ell	Semi-ell	Pressed Steel	1,9
Pwd 2 Rev Pwd 2 Rev	81.5	5.5	1 5	4.5	Worm					Elec		Semi-ell	Semi-ell	Pressed Steel	2,0
Pwd 5 Rev	80	56	14	55	Chs	I beam	Rect			Hubs				rressed steet .	1.3
Pwd 2 Rev	86	56	15	5.5		I beam	I beam	36x2 5	36x2 5	2 prs		Semi-ell.	Semi-ell.	Spl. Des	2.2
	91	5.8	1.2		Chs						J.S	7-ell	Platf		2.8
	91	56	12	45	Chs	Tubular	Tubular			Hubs		Semi-ell	Platf Semi-ell	Channel Steel	
	92	56	12	13	Ch.	I-beam	Forged	34x3 5				Semi-ell	Semi-ell.	Pressed Steel.	2.2
Pwd 2 Rev	100		1.2		Gear			30x3 5	36x4	Elec .	Hubs	Semi ell .	Semi-ell		2.5
Pwd. 5 Rev	84	58	1.2	5.5	Chs	I beam	Rest			Hubs		Semi-ell.	Semirell		1.4
Pwd 2 Rev	102	0()	10	4.5 5.5	Chs	Square	Round.			Hubs		Semi-ell. Semi-ell	Semi-ell Semi-ell	Channel Steel Channel Steel	
	07 5	56	10	33	Chs		Tubular		36x3.	Hubs		Semi-ell.	Full-ell	Channel Steel	2.0
	104	58.5	9 2	1	Chs		,	36x4		Hubs		Semi-ell	Semi-ell		1
	96	6.6		50	(75m			30%3		Hubs		Semi-ell	Semi-ell		
Pwd. 5 Rev	96	62	11		Chs	I-beam	Rect	34x3 5		Hubs .		Semi-ell	Semi-ell	Channel Steel	1.6
1 1111	9 0		,	45	Chs	Tubular	Tubular	Opt		Hubs		Semi-ell	Semi-ell.	Channel Steel	
B 1 - 1 - 7	120	62	10	1	Gears	i douisi	11000100			Hubs		Semi-ell	Semi-ell.	Pressed Steel	3.2
Fwd2 Rev	1:6.							Opt							1.3,0
Pwd 2 Rev			0	14.5	Chs	Round	Round			Hubs		Semi-ell.	Semi-ell	Channel Steel	
	117	62 5	9.2	10	Chs			Opt 36x5	36.35	Hubs		Semi-eli Semi-eli	Semi-ell	Channel Steel	1
	117	02 3	7.2	3.5	Chs			Opt .	,017	Hubs		Semi-ell	Semi-ell	Channel Steel	
1 111		1	7	3.0	Cha			Opt		Hubs .		Semi-ell	Semi-ell	Channel Steel	
	118	7.3	1		Chs					Hubs.		Semi-ell	Platf .	Channel Steel	1.
Pwd. 2 Rev	133	62	10		Chs			36×5		Hubs DElec	Hubs	Semi-ell	Platf	Wood & Steel	1 ::
Fwd. 2 Rev	126	6.3	8	40	Chs	Round	Round	36%6		DHubs .	THUES	Semi-ell	Semi-ell	Channel Steel	4.2
	127	7.5	0		Cha			36 x 5	16841	Hubs .		Semi-ell	Semi-ell	Channel Steel	1
Pwd 2 Rev	132	1	7	2.5	Gear			35x4 D			Hubs .	Semi-ell	Semi-ell.		4.1
Pwd 2 Rev	139	72	8 7	3.5	Chs.	Trussed .	Trussed	36x4 D		Hubs	Hubs.	Semi-ell.	Semi-ell.	I-beam	5,0
Fwd. 2 Rev		7.6	7.5	33	Chis	IN COLUMN	IVORDITAL .			Hubs		Semi-ell.	Semi-ell	Channel Steel	

NOVELTIES SEEN AT ACCESSORY BOOTHS.

THE accessories displayed at the metropolitan shows were unusually attractive for many reasons. First of all the number of individual exhibitors was larger than ever before. Every conceivable form of equipment was shown and there was a decidedly larger proportion of exhibitors of finished and completed accessories. In previous years the exhibits of makers of parts and components constituted no inconsiderable section of the expositions, and while this character of display was still large, the proportion was smaller when contrasted with those of accessories and supplies.

With all lines of equipment there was a marked degree of progression, either in construction, refinement, accuracy or finish, and there were many new devices that attracted decided attention. Among these might be instanced the lighting and starting installations, many of which were to be seen in the cars displayed, and naturally there was adaptation of the lamps for the approved lights and the means for making them, as well as the necessary changing of the motors for the installation of the light generators.

pleasure and service wagons. These included the Fire stone quick detachable clincher tires, adapted for al quick detachable rims with clincher side rings and Firestone quick detachable demountable rims; Firestone quick detachable straight-side tires, these being with smooth or non-skid treads; Firestone tubes, and the Firestone quick detachable demountable rims, for pleasure car equipment; Firestone cushion tires for electric carriages with double tread and internal cavaties, both in regular and special forms; Firestone side-wire tires for motor truck service in regular, hard base, flange and block types on regular channel rims or on quick removable rims for quick tire changing; Firestone side-wire tires for horse drawn and heavy motor driven apparatus, and other Firestone specialties. While all of these products are well known the cushion electric tire was shown for the first time. It is a development of the special electric tire and its riding qualities are said to be admirable. It is made in both smooth and anti-skid types. With these tires the side-wire method of attachment has been adopted, it having been proven under the most severe service.



Examples of Anti-Skid Tires: 1, Firestone; 2, Goodyear; 3, United States; 4, Nobby Tread; 5, Ajax,

With standard motor vehicle equipment changes were noted which were intended to increase efficiency. This might be said to be a result with practically every established accessory. Some of these were especially interesting and attracted many of the visitors.

TIRES.

Ajax-Grieb Rubber Company, Trenton, N. J.—The display made by this concern was of all types and sizes of the Ajax tires, both non-skid and wrapped tread. With the non-skid Ajax the tread is made up of diamond-shaped projections which are formed by diagonal V-shaped channels crossing at right angles, with bevelled edges to prevent retention of matter from the road surfaces. This tread is claimed to be especially efficient as a preventive of skidding, even on the smoothest paving. The tire is made in extra heavy sizes as well. The Ajax wrapped tread is the conventional smooth form. Both types of tires are made for the regular clincher and quick detachable rims of standard makes.

Firestone Tire & Rubber Company, Akron, O.— The Firestone exhibit was of tires and rims for both

Goodyear Tire & Rubber Company, Akron, O.-One of the real big things of the tire display was the 44 by 5.5-inch tire exhibited by the Goodyear company. The exhibit included all of the Goodyear types, both in smooth and anti-skids, these being adapted for all standard rims for clincher and quick detachable shoes. The non-skid tires have surfaces with grooved channels in parallel crossing the treads diagonally, making diamond-shaped projections of considerable size to contact with the road surface and afford a secure "grip." The tire surface is doubled in depth and its endurance is very great. Another specialty is the no-rim-cut Goodyear tires that are 10 per cent, over size and are so designed that there is no angle of the rim contacting with the shoe under the heaviest pressure when deflated. These are made with or without the anti-skid surface. The beads of these tires are strengthened by piano wire vulcanized into them so there can be no stretching under any condition of service. The Goodyear air bottle for inflating tires occupied a prominent place at the stand.

Michelin Tire Company, Milltown, N. J.—The products of the House of Michelin are standard the world over and these were displayed at the stand of

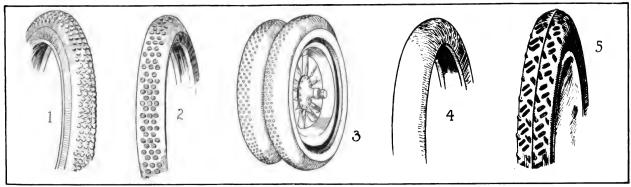


this company. The Michelin types that are best known are the smooth or round tread and the antiskid tread of steel-studded leather, these being made in both clincher and quick detachable forms. The noted Michelin racing tire has the anti-skidding tread, this form of equipment being very widely known. The Michelin demountable rim is one of the best, although it was the first of this type and it has been perfected until it has been very generally adopted. Besides the shoes and rims the display included the Michelin tubes, the Michelin repairing specialties and tire tools.

Empire Tire Company, Trenton, N. J.—All the Empire specialties were shown at the booth of the Empire Tire Company, chief among these being the improved Empire clincher shoes of open-cured, round tread type. The construction of this tire is such that it may be used on both the standard clincher and the standard quick detachable rims. The Empire straightedge oversize shoe is designed for use with quick detachable rims only, this being open cured and of unusually heavy construction. The Empire red tubes are claimed to have special merit in that they possess the highest degree of elasticity, and besides these the line includes the Empire peerless and the Empire standard tubes. The Empire tire reliner or preserver

Shawmut wrapped tread quick detachable clincher tires for standard quick detachable rims, Shawmut wrapped tread quick detachable "U" tires for all standard straight side or Dunlop type rims, the last two being with solid beads reinforced with wire. All of these are made with round or block treads, the block being the anti-skid surface with protuberances molded to firmly contact the road surface. The exhibit included as well tubes, floating flaps (designed to protect the tubes from chafing on the wheel rim), and Shawmut accessories and repair materials and stock.

United States Tires Company, New York City—The products of this company have been known for years under the distinctive names of the four constituent companies, the Hartford, G & J, Morgan & Wright and Continental, each of which has some representative quality in tread, manner of attachment or construction, but besides these brands the "United States tire" was introduced to the motoring world. This tire has been produced under a unique policy, the factory experts combining in it the strongest qualities of each of the four other standard tires. One of the features was the "Nobby Tread," made at both the Morgan & Wright and the G & J factories, facilities for manufacturing it having been recently in-



Representative Tire Types: 1, Kelly-Springfield Anti-Skid; 2, Michelin Non-Skid; 3, Michelin Dual Non-Skid; 4. Empire Round Tread; 5, Shawmut Block Tread.

is an endless band of rubber and fabric that encircles the tube and effectually protects it against puncture. In addition the usual Empire repair materials were displayed.

Kelly-Springfield Tire Company, New York City— The Kelly-Springfield tires include two distinct lines, the pneumatics or standard types for pleasure cars, and the special forms for motor truck service. these the Kelly-Springfield pneumatic shoes and tubes are claimed to have construction and material that are unusually enduring and in support of the claims for service the display included a number of shoes that had been driven from 7000 to 12,000 miles without the fabric being damaged. These facts were supported by properly authenticated statements by the owners. The Kelly-Springfield motor truck tire is of the sectional type in which any one rubber block may be quickly removed from the rim should it be damaged, and the blocks are arranged in two or three rows according to the duty required of the tire. The blocks are set staggered or overlapping so that there will be equal wear under load stresses.

Shawmut Tire Company, Boston, Mass.—The Shawmut line displayed included the Shawmut wrapped tread clincher tires for all standard rims,

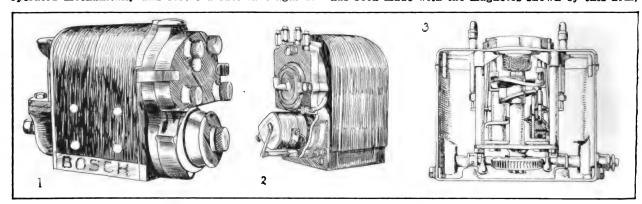
stalled at the G & J plant. Conspicuous was the showing of solid tires, prominent in which was the new standard demountable tire recently placed in the market and maintained to be a great advance in truck tire development in that it is the first tire to meet all of the requirements of specifications recently adopted by the Society of Automobile Engineers, and the only tire of dual construction that can be replaced without removing the wheel from the truck. The exhibition incidentally was the largest ever made at a show by a tire company.

MAGNETOS.

Bosch Magneto Company, New York City—A complete line of its well known magnetos was shown by the Bosch Magneto Company, this including types DA2, used for small single-cylinder engines; DU independent magneto, for use on engines from one to six cylinders; DR two-spark for engines up to eight cylinders; DU6 dual for six-cylinder motors to 4.5-inch bore and stroke, and D independent for large motors from three to six cylinders and especially those of slow speed. Besides these there are numerous other instruments, the production embracing every re-

quirement for automobile, motorcycle, motor yacht and aeroplane use. In addition the Bosch products include spark plugs, battery ignition systems, combination magneto-battery systems, and Bosch oilers for all sizes of steam locomotives, machinery and internal combustion engines. It is hardly necessary to speak more than collectively of the Bosch magnetos, these being adapted for every service, but in the ZR models, which are developments of the D and DR types, the refinements relate chiefly to enclosing all the operating parts. The magneto may be timed without removing any of the parts by means of a glass-covered sight hole in the distributor through which the position of the distributor brush may be noted. A second sight hole at the top of the distributor permits examination of the gear teeth of the distributor, one of which is marked. Lining this marked tooth with marks at the side of the top sight hole will bring the magneto in exact time for the full advance position; therefore, for timing it is necessary only to turn the distributor until the figure 1 appears at the front sight hole and to bring in register the marked gear tooth with the lines in the top sight hole, the piston of cylinder No. 1 being in the firing position. The Bosch oiler is operated mechanically and forces a lubricant against of time, as well as the new Splitdorf high-tension magneto produced for foreign trade, and the new "booster" type of high-tension magneto that is now practically ready for the American market. was shown a working model of the largest magneto in the world, which weighs nearly 800 pounds and is nearly four feet in height. This giant instrument produced a current that jumped a half-inch gap in a mammoth spark plug. The refinements of the lowtension instruments have been mainly with reference to improvements of the insulation. The "Splitdorflite." which is a lighting and ignition system, the lighting being from a generator, attracted much attention. With this system a single shaft drives a low-tension magneto and the low-tension dynamo which supplies the energy to a storage battery, whence it is distributed to the lamps of the car and to the motor for ignition in the event of need. This installation was demonstrated with a series of lamps and spark plugs as though supplying both lights and motor. A lighting system in which the generator alone was in service for the lamps, this being designed for cars already magneto-equipped, was another feature of the display.

Herz & Co., New York City—Material refinement has been made with the magnetos shown by this firm,



Seen at the Magneto Booths: 1, Bosch Instrument; 2, Remy Device; 3, Bosch Olier.

any practical pressure. It is simple in construction and springs, gears and other small components are eliminated. The single screw used is for adjustment of the feed. The pump consists of a cylindrical plunger for the feed and another for the valve. These are actuated by discs set at angles on the central rotating shaft. The upper ends of the plungers engage with the edges of the discs and are given a reciprocating motion by their action. The instruments are fitted with or without sight feeds and may be utilized for any number of leads. They are not affected by foreign matter in the oil and are absolutely accurate.

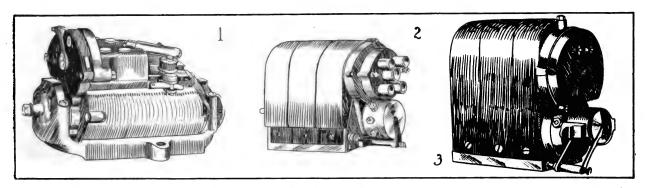
C. F. Splitdorf, New York City—One of the most interesting exhibitions of the show for those interested in electrical ignition was that made at the Splitdorf stand where there was a demonstration of construction and operation of unusual educational value. One of the features was a sectional view of a model F low-tension magneto in which the armature, distributor and circuit breaker were fully visible and the relation of the one to the other perfectly clear. Besides this there were the varying models of low-tension magnetos that are produced by the Splitdorf works and which have been used for varying lengths

one of those noted in the automobile instruments being the insulation of all exposed secondary connections to guard against shocks and to protect the magneto. The magnetos are fitted with an automatic timing adjustment which consists of two juxtaposed coupling flanges in each of which are six grooves curving radially from the centre, the grooves in each curving in reverse of the other when faced. Into each of the grooves a single steel ball is set, these six balls serving as couplings and governor weights. The position of the steel balls is affected by the slightest change in engine speed, this bringing the timing automatically under control. It is claimed for this device that the motor may be started with the spark fully retarded and that the motor automatically at all speeds gives its full spark efficiency. Any degree of adjustment may be had within 40 degrees by varying the curve of the grooves in the coupling flanges. The manner of demonstration was very ingenious and showed on & screen and to a scale the variance from a given point at different speeds. On slow speeds change of adjustment was shown with a difference of 20 revolutions a minute, the shifting being rapid at first and then more slowly and steadily as the speed increased.

Marburg Bros., Inc., New York City-The exhibit of this concern included a demonstration of all sizes of the latest types of Mea magnetos, which have become widely known for automobile ignition in America. The 1912 instruments have been considerably improved as compared with those of previous years, the principal refinement to the casual observer being the protection afforded against water, mud, dust and oil. Several types are now entirely enclosed and should not be affected by the hardest rain, a condition which assures continuance of operation under all conditions. The Mea is this year made in dual types for all sizes. these being shown for the first time at Madison Square Garden. Many minor improvements are manifest to those who make a close examination. Besides the magnetos the firm has this year taken over the sales of two more specialties, the one being the S. R. O. ball bearings, it being claimed that these are made by the oldest factory for ball bearings in the world. The bearings have ball races guaranteed to be turned from solid metal. The cage consists of two L-shaped steel stampings riveted to form a T, making a very strong cage and as the shape is a scoop the lubricant is forced through the bearing. The other specialty is the Marburg-Hagen spring, manufactured at Hagen, Germany,

retaining the Remy features of outside adjustment and simplicity. The contact screw is held by a lock spring. To make adjustment, the spring is lifted with the thumb and the screw turned. Inside the cam house an oiling wick insures complete lubrication of the cam under all conditions. The weight of the cam lever is reduced and the length of the spring increased, insuring certain action and greater durability. cam house is held in place by a spring mounted on a stud projecting from the end of the magneto base. The insulation is "bakelite" which is said to be mechanically stronger than hard rubber and fully resistant of heat and chemical reaction. The magneto is mounted on cone type ball bearings that minimize friction. The instrument has been subjected to extremely hard tests and has not failed under any one.

K-W Ignition Company, Cleveland, O.—The exhibit of K-W ignition and lighting equipment was very complete and included a road lighting outfit, a lighting installation for Ford cars, and a special magneto for marine and stationary engines. The road lighting system is designed to give electric lights for the search lamps and such other lamps as may be used when the car is in operation on the road. The current is generated by low-tension magneto and



Three Well Known Types of Magnetos: 1, Mea; 2, Splitdorf; 3, K.-W High-Tension.

where carriage springs have been made for generations. The springs are made from high carbon steel and the elastic limit claimed for them is 195,000 pounds to the square inch. These springs are used exclusively on Benz and Mercedes trucks.

Remy Electric Company, Anderson, Ind .-- A demonstration of efficiency by unusual methods was the feature of this display. Working models of all late developments in Remy magnetos and electrical lighting devices were shown in operation. A "hot-spark lowspeed test" was made by using glass chambers containing air compressed to 100 pounds pressure in which were located spark plugs with the gap set at .02 inch, connected with magnetos driven by motors that turned 100 revolutions a minute. It is claimed for this instrument that it gives the same spark when fully retarded as at high speed. The new Remy magneto is a two-magnet instrument, weighs 20.5 pounds, is 7.5 inches high, 7.75 inches in length and 4.37 inches wide. All wearing parts are of chrome-nickel steel, specially tested. The magnets are of tungsten steel, heat treated and hardened. The inductor shaft is tapering, ground to size and cut for a Woodruff key. The cams are of nickel steel ground to size and carefully hardened. The cam house is smaller and improved,

utilized to its fullest capacity. The Ford lighting outfit is designed for use with the Ford magneto only, but it may be used with any other car with a storage battery or the K-W low-tension battery as a source of current. The K-W special magneto may be driven by belt from the flywheel if desired. The lighting systems of K-W design are intended to eliminate the gas tank or generator and it is claimed for them that they are exceedingly durable and extremely simple, there being no construction that is not substantial and free from possibility of the usual causes of electric current failure. The Ford lighting system may be used merely with the switch and without a master vibrator, although the master vibrator is recommend-Besides the lighting outfits the K-W specialties include both high and low-tension magnetos, headlights, master vibrators, spark coils, and minor productions.

SPEEDOMETERS.

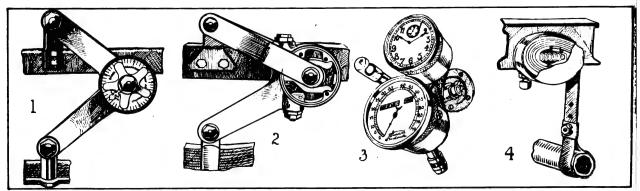
Warner Instrument Company, Beloit, Wis.—The instruments exhibited by this company included the well known Warner auto-meters, tachometers, cut meters, anemometers and railroad auto-meters, as well



as parts and sections of the assemblies to demonstrate construction. Chief of these was the auto-meter, which is produced in 10 different models. The Warner speed and distance indicator has not, save for refinements, been changed, but a novel feature has been added to the bezel types during the past season. This consists of a button projecting from either side. That at the left may be used to reset the trip mileage reading to zero with a single turn. That at the right moves the miles and tenths of miles only and by turning the two together it is possible to adjust the reading to any desired mileage on the trip register. With this it is possible for the convenience of tourists to note the precise mileage of any digression from a stated route and at return to adjust the reading to conform to the routed mileage. This form of record is very desirable as it precludes the necessity of making note of any difference in the readings of the odometer with the stated figures of a route. The higher priced instruments have trip odometers that will register to 1000 miles and season odometers that will register to 100,000 miles. The bezel instruments are fitted with electric lighting attachment beneath the bezel which concentrates light on the speed and distance registers. With the clock combinations Chelsea clocks

odometer is contained in a special hub cap that fits all standard makes of wheels and is an inch longer than the ordinary hub cap. It registers the mileage, whether forward or backward travel, is sealed and cannot be tampered with. The Jones gasoline gauge is for dash installation and may be quickly installed. The gauge is screwed to the dash and from it a copper or rubber tube extends to the top of the gasoline tank. connecting with another brass tube extending to the bottom of the tank. The principle of indication is by an expansion chamber influenced by the gravity of the gasoline. There is no possibility of wear or leakage. In addition the well known Jones live map was shown and there was a demonstration of speedometers operated by motor. The "De Luxe" model speedometer has a 4.5-inch dial and with this the trip indication may be set as desired by buttons at either side of the instrument, turned in combination, the right controlling the tenths and units, and left the tens and hundreds, so that a change may be made at any time to correspond with the route mileage of a road book.

Stewart & Clark Manufacturing Company, Chicago—The Stewart speedometers for 1912 are new in every respect and while being of the magnetic type the mechanical details are materially changed. The



1, Truffault-Hartford Shock Absorber; 2, Peerless Shock Absorber; 3, Stewart Speedometer; 4, Gabriel Rebound Snubber.

are used with outside wind and set instead of rim wind and set as in previous years. In the demonstrations of the instruments by means of a rheostat at the back of the case the speed of the motor was varied so that the corresponding changes in the positions of the indicators could be seen. In connection with the display was shown the new Warner unbreakable driving shaft casing.

Jones Speedometer Company, New York City-While the principal exhibition by this company was speed indicators the display included the Jones recorder, gasoline gauge, hub cap odometers and speedometers for power wagon use. The speedometers shown were in numerous types, each suited for a special vehicle. The Jones recorder is a time clock that records time, speed and distance, when the vehicle is in motion or stopped, the time stopped, the speed during operation and the mileage. The record is made on a chart that may be removed as desired. The recorder is operated by a flexible shaft as is a speedometer. It is an enclosed clock in which the record is made by a marker, the case being locked and the key held by a person of responsibility. It is specially designed for service vehicles. The Jones hub

odometer has a direct driven stop movement, the figures being on celluloid cylinders on bronze gears. No springs are used. The form of the dial is changed so the registers are through large openings instead of a port for each figure. The totals are 100,000 for the season and 100 for the trip, the trip register being adjustable to a tenth of a mile at will. This makes convenient, the use of a road book when touring without making note of the odometer reading if there be a side trip from the main route. These instruments have regulators which will permit of adjustment should there be variation for any cause. This is intended to meet a demand for a scientific meas-The regulating urement of distance or speed. accomplished by a micrometer adjustment that increases or weakens the influence of the magnetic field. The adjusting is to a fraction of a second. The hand staff is of new design and is not susceptible to vibration under the severest road stress. The shaft casing is a new type and of a construction practically unbreakable, being formed of two different kinds of special wire, but the shaft is not changed A marked improvement is the use of a drop forged swivel joint that is expected to yield a service greater

The Reputation of Firestone Tires

IS BACK OF

Firestone"

QUICK-DETACHABLE

DEMOUNTABLE RIMS

BUILT FROM THE TIRE MAKER'S STANDPOINT

Save Your Tires Because moisture inside the tire will decay both the casing and the tube, we build Firestone Demountable Rims with a "no-split" or unbroken base that keeps water out.

Quick - Detachable In Fact You can change inner-tubes when the rim is either on or off the wheel, just as with a regular quick detachable rim. The unspeakable nuisance of having to change tubes on a loose rim is done away with in the Firestone.

Parts Are Non-Rusting Firestone rims are designed and built to defeat rusting together of parts. Every car owner knows this means freedom from the uncertainties that go with other rims.

What's More

Firestone Demountable Rims are the lightest in weight of all demountable rims possessing a real quick detachable feature.

They Are the Only Ones That Have Withstood the Test of Time.

SPECIFY FIRESTONE TIRES AND DEMOUNTABLE RIMS ON YOUR NEW CAR --- INSIST UPON THE BEST.

The Firestone Tire and Rubber Co.

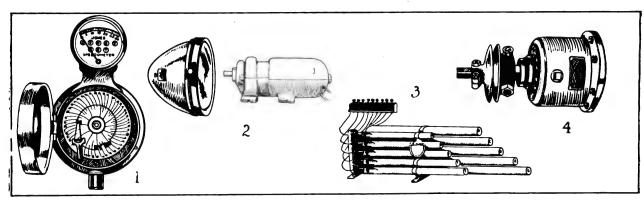
America's Largest Exclusive Tire and Rim Makers.

than the life of the car. To produce this joint the company is building and equipping a large forge plant. The other fittings are equally new and intended to give the highest degree of service. The clocks included in the instruments are rim winding and setting. The instruments are made with three and four-inch dials and with different speed ranges of indicators, there being 16 models in all. Of these eight are combinations with clocks. Of the others one is adapted for electric automobiles and power wagons and three for motorcycles.

SHOCK ABSORBERS.

Hartford Suspension Company, Jersey City, N. J.—All forms of Truffault-Hartford shock absorbers were displayed by this concern, these being made in four sizes for differing weights of cars and in several finishes. While there has been no change in the construction of these devices ingenious methods of demonstration attracted much attention. The one was by two miniature motor cars side by side in a frame with the wheels resting on large cams. As the shafts carrying the cams were revolved the effect was to give a decided shock to the tires at each revolution, this

of proportions. These are specially adapted for steadying the spring action of any vehicle and are the extreme of simplicity, there being nothing to wear, no matter what the service. The Peerless shock absorber is another device of the "scissors" type in which the movable arm actuates a two-way cam between two levers within a case or housing, these levers being fulcrumed at one end, the other end being kept contacted with the sides of the cam by coiled springs. The case is packed with grease and is water and dust tight. The arms are attached to the chassis frame and the axle. As the springs are compressed or recoil more than two inches allowed for such free action the movable arm turns the cam slightly with reference to its position between the two levers and the coiled springs are correspondingly compressed. With the reverse movement of the vehicle spring the shock absorbing process is repeated. The extreme resistance of the absorber is when most needed and it is not constant during the entire action of the vehicle spring. When the roads are rough the maximum of supplementary resistance is given. Sager Spark-O-Lite outfit is intended to instantly make the lights in the gas head lamps, to adjust the flames to any desired intensity, and to extinguish the



1, Jones Speed Recorder; 2. Gray & Davis Lighting Outfit; 3, Gabriel Exhaust Horn; 4, Hele-Shaw Clutch.

exaggerating the condition to be met with by the average car when driven along a rough road surface. The one car was fitted with a complete set of tiny shock absorbers, while the other was with unrestrained springs. The extreme difference in spring action was apparent to those who observed the two cars. The other illustration was with a full elliptic car spring which was compressed by power of an electric motor and then permitted to recoil. At each alternate compression a Hartford shock absorber was automatically engaged, this showing the extremes of spring action with and without the use of the device. Another display was the Hartford auto-jack, for which an extreme lifting capacity with little effort is claimed. A third exhibit was the Hartford electric self-starter and lighting system, which was decidedly attractive to all visitors at the stand.

J. H. Sager Company, Rochester, N. Y.—While listed among the shock absorbers because this firm has been one of the first manufacturers of such devices the line shown was very complete and included other equipment of standard quality. The Sager equalizing springs have been known for years and are made for attachment to any model and make of car irrespective

lights. This is accomplished by moving a kick switch lever and turning a hand wheel gas controller. The system may be used with a generator for lighting the lamps and the gas controller may be used with gas tank only. Or the system may be used in connection with the form of motor ignition. The Sager bumpers are made in six types to meet any requirements, all being constructed to give protection to the lamps and radiator of a car. The Rochester and Simplex models may be clamped in place without removing the bolts from the spring horns or drilling the frame.

LIGHTING SYSTEMS.

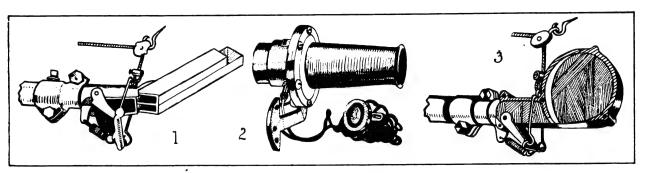
Gray & Davis, Boston, Mass.—Aside from its splendid display of motor vehicle lamps, in the manufacture of which this firm is a pioneer, one of the features was the demonstration of the Gray & Davis electric lighting dynamo system which lights the lamps, charges the batteries and furnishes current for power, horn, speedometer, light, and the like. The dynamo is compact in construction, weighing 19.5 pounds and is driven by the motor. After installation it requires

no attention. Every function is controlled by a dash switch. The dynamo generates the current and supplies it to the Willard storage battery used with the outfit, and thence it is utilized as desired. But the dynamo is independent of the battery if preferred and may light the lamps without battery connection. The generator has the constant speed that is essential to direct lighting. There is an automatic cut-out that makes a reversal of the current impossible and prevents the delivery of an excess of current to the The cut-out operates slowly, only storage battery. between the speeds of eight and 12 miles an hour as a rule, and there is no possibility of the platinum points being pitted. A complete lighting system was in operation at the exhibit to demonstrate its possibilities. In the lamp display every form of oil, gas and electric lamp was shown, as well as combination and special lamps designed for certain types of cars.

Esterline Company, Lafayette, Ind.—At the exhibit of this company the feature was the slow speed lighting and ignition generator. This device is constructed to be operated at engine crankshaft speed, and it is so designed and balanced that it will always meet the exact requirements for lighting or ignition. This is accomplished through having a perma-

is given impulse by a miniature railway electric motor which has a field composed of 75 very thin discs of special steel in place of the usual form of cast iron field, this requiring the use of but 3.5 to 4.5 amperes current consumption from the battery. The motor requires no oiling and sound adjustments are unnecessary. The sound created is deep and pleasing instead of high and irritating to the nerves.

Randall-Faichney Company, Boston, Mass.-The Jubilee exhaust horn exhibited by this company for the first time is designed to be attached to the outlet of the exhaust pipe of the car and is controlled by a pedal. This causes a harmonious tone that is distinctive and can be heard a long distance. The construction is simple in an extreme and is very enduring. The operation is such that both hands of the driver are free when they are needed for control. There is nothing that can become deranged and there is no maintenance cost. In addition to this the well known Jericho exhaust horn was shown, this having but one tone. For this the same simplicity of operation and absence of upkeep cost are cogent factors for adoption. Besides these horns the widely known B-Line and Boston grease and oil guns in differing capacities were also demonstrated in an effective manner.



1, Jubilee Exhaust Horn; 2, Newtone Electric Horn; 8, Jericho Exhaust Horn,

nent and a temporary field as well. The current generated is supplied to a storage battery and thence is distributed according to the needs. The system may be adapted to practically all cars and is a very substantial installation that has been productive of excellent results under all conditions of operation. In connection with the control of the lamps from the dash the Esterline switch may be changed so that the laws of the states that require that the tail lamp be lighted independently of the others and extinguished only at the lamp itself, may be complied with. This company produces numerous electric specialties, a number of which were displayed.

SIGNAL HORNS.

Automobile Supply Manufacturing Company, Brooklyn, N. Y.—Prominent at the display of this company was the Newtone horns, the latest type of which is produced in three styles. This concern has made horns for more than seven years and maintains that this production is ideal from point of tone, it having a volume that will be heard a mile. The diaphragm is rust proof and it is actuated by a vibrator by a cam having six faces or toes. The vibrator

Gabriel Horn Manufacturing Company, Cleveland, O .- The Gabriel horns with one, two, three, four and 10 tones were features of this display, these being blown by the exhaust of the engine and giving varying tones according to the number of tubes. horns attracted much attention, especially that with 10 tones, but were not demonstrated. The claims for these are that they are always available and can be used so long as the engine is in operation, and have been proven by years of service. Another feature was the Gabriel rebound snubber and this replaces the Gabriel shock absorber. A containing case is attached to the frame of the car and in the centre of this is a thick circular sleeve in halves. One of the halves is fixed and serves for a clamp for attachment to the frame by a set screw. Outward from this extends a stud carrying a sleeve from the movable half of the split sleeve, and surrounding this sleeve is a helical spring. Attached to the fixed half-sleeve is a belt faced with flexible metal and this is maintained at tension with relation to the vehicle spring. When the vehicle spring is compressed the belting is taken up and when it recoils the belt resists because of the compression of the helical spring within the coil creating frictional resistance.



LUBRICANTS.

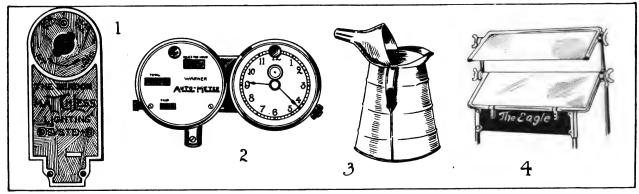
Joseph Dixon Crucible Company, Jersey City, N. J. -The exhibit of this concern included varying compounds of flaked graphite and graphited oils and greases suited for all services. The Dixon products are widely known and are specialized for differing conditions. One demonstration was with two transmissions driven at constant speed by electric motor wherein the greases were shown adhering to the revolving gears. The Dixon graphited compounds are specially prepared for transmissions, differentials and bearings and endure under conditions of heat or extremely heavy work. The display included specimens of the packages, ranging from the tiny tube to the large tin and from the stick form to the barrel. Besides these, samples of the graphite used in the manufacture of the different grades were shown.

A. W. Harris Oil Company, Providence, R. I.—Harris oils and greases are known of all motorists and the display by this concern included all of its products in varying forms and packages. Each year a demonstration of quality has been made at the shows and these have always been interesting and educational. The feature of the exhibit was a single-

would remove free carbon, and that using fuller's earth or bone black made this so costly that it was not often adopted by the compounders of lubricants. There was also shown a complete line of the Havoline gear oils, motor grease and graphited grease.

George A. Haws, New York City—Panhard oils of every grade were displayed at the exhibit of this firm, and those in the different packages in which they are offered for sale. In the demonstration of these lubricants it was stated that the greatest care was taken to refine the oils to standard and that the base of each was the best Pennsylvania crude oil, which has qualities which specially suit it for internal combustion engine work. While Panhard oils are light in color it is claimed that they have heavy bodies and will endure extreme heat that is generated in the engine cylinders. The Panhard oils have been manufactured for motor vehicles for years and have been proven to be productive of high engine efficiency wherever used.

New York Lubricating Oil Company, New York City—This concern, since consolidation with the Columbia Lubricants Company of New York, has produced and marketed the well known Monogram oils and greases, there being no less than 13 different



1, Esterline Lighting System Switch; 2, Warner Auto-Meter; 3, Dover Hand Measure; 4, Eagle Clear-Vision Windshield,

cylinder, four-cycle engine that was driven by a motor. A section of the crankcase had been removed and the opening filled with plate glass through which the interior of the case could be seen by the visitors. Within the case an electric light was installed and when the engine was operated by a belt from the flywheel to an electric motor the action of the lubricant when the splash system of engine oiling is used was shown. In this motor the quality of oil best suited for the service was used. The process of lubrication was explained by the engine. In addition to this the packages of the oils and greases were shown.

Havoline Oil Company, New York City—The freedom of Havoline oils from free carbon was demonstrated at this exhibit by a comparison of a grade with other oils. The oils taken as subjects were stated to be regarded as standards. In a row of three cups were shown the oils untested and in another row of cups the residuum from each after a process of combustion to reduce the lubricants to carbon only, this being likened to the condition resultant in the cylinders of a motor. Next the clearness of the Havoline oils was shown to demonstrate the claim that they had been thoroughly filtered, the only process that

brands, some of these in more than one grade, and auto and hand soaps. For engine use these lubricants are made from the best Pennsylvania crude oils and have very high flash and fire tests and are claimed to hold their viscosity longer under intense heat. The oils are thoroughly filtered and are not acid treated, being a straight-run product and not compounded. Being of one grade the oil is uniform in its influence, there being no element dissipated to leave a residuum when subjected to the great heat of combustion in the cylinder chamber. It is claimed that results are more conclusive than any other statements that might be made in connection with the use of Monogram oils, and the company has published a series of letters from racing drivers, who have been winners or leaders of the principal events for several years, in testimony of the satisfaction given by these lubricants under the most severe conditions of service.

New York & New Jersey Lubricant Company, New York City—Under the brand name of MoToRol this concern manufacturers varying grades of cylinder oils for gas engine lubrication, and similarly prepares for gear lubricating purposes Non-fluid oils. Both of these are standard brands and have long been known

THE SELDEN CAR

Five Beautiful Models \$2500—\$3750

The determining factors in your choice of a Motor Car should be comfort, efficiency and attractiveness.

The Selden possesses all these desirable features in a high degree not possessed by any other car but the most costly.

The Selden challenges comparison with cars of the highest price.

Selden Motor Vehicle Company

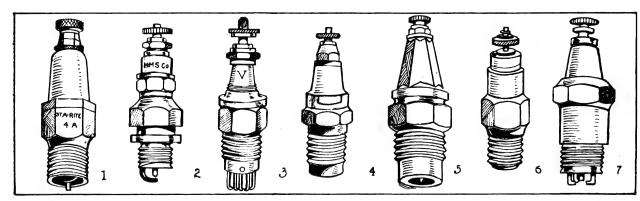
Rochester, N. Y.

to motorists. These were exhibited in glass at the display for the purpose of showing color and viscosity, while a sliding gear transmission driven by a motor was used to demonstrate the lubricating qualities of Non-fluid oil under conditions as nearly approximating actual use as could be devised. In connection with this exhibition was shown the "Kejex" gun can packages for one grade of Non-fluid oil which are of one and two pounds capacity. The cans are cylinders with a regular cap at the top. This cap may be removed and a long curved spout screwed on in its place. A wide-winged key is then adjusted at the bottom of the can and by turning this the bottom is forced upward in the tube and the grease is forced out through the spout, the package being converted into a handy and convenient grease gun for filling cups, differential and transmission cases, wheel hubs and every other receptacle for a heavy lubricant. The package is always available and there is no loss of contents, while the disagreeable filling of the grease gun is avoided.

The Texas Company, New York City—The Texaco motor products were displayed by this company, these being in the nature of motor oils, transmission greases and bearing grease. Although this line has been placed in the market within a comparatively short time

five feet in length filled with oils. Lights were arranged so as to show the differing colors of the grades and to permit comparisons of each, as well as to demonstrate the result from refining, an interesting effect being produced by the white background. Besides this the oils were displayed in smaller tubes for closer examination. There are six grades of Mobiloils, each prepared for a specific purpose and assurance is given that with these and conditions for which any one is adapted admirable results may be obtained. Besides the oils Vacuum transmission greases were demonstrated by a sliding gear transmission operated by an electric motor, showing the quality of lubrication under differing conditions of operation. While not as well known as the oils the greases are maintained at the high Vacuum standard. Some decidedly interesting literature was distributed to the visitors.

Wolverine Lubricants Company, New York City—The well known Wolf's Head oils and greases, Wolf's Head crystal oils, and special Packard lubricants constituted the exhibition by this concern. The Wolf's Head cylinder oil is in three grades, besides marine oil and gear oil, and motorcycle oils, the crystal oils in three grades, and the greases in five, making 14 different brands in all. The oils were attractively dis-



Typical Spark Plugs: 1, Sta-Rite; 2, H. H. S.; 3, V-Ray; 4, Miller; 5, Splitdorf; 6, Herz; 7, Bosch.

The exhibit was it is complete in every respect. largely made in ornamental glass jars which demonstrated the color and the viscosity of each grade and explanation was made of the purposes for which each was particularly suited. It is claimed for the Texaco engine oils that they are especially free from carbon and refined to obtain perfect combustion in engine cylinders at extremely high temperatures and to remain fluid at a zero temperature. In other words they are prepared to yield the highest efficiency under all conditions of operation. The greases are also made with a purpose of affording the best of lubrication for transmission and differential gears and bearings. The oils and greases are prepared in special packages, those for the oil being made with an inner seal that must preserve the contents intact until broken by the purchaser, and there is a special spout provided for pouring the oil from each package.

Vacuum Oil Company, Rochester, N. Y.—Mobiloil in different grades and Vacuum transmission greases constituted the exhibit of this company, the display being decidedly attractive. At the entrance to the stand were two columns with bases enameled white on which were arranged racks containing glass tubes

played in glass jars and tubes to illustrate the colors and densities, and in addition about were hung framed letters of recommendation from automobile companies using them. Besides, the Packard line of cylinder, transmission and timing gear oils were shown, and Packard graphited grease and cup grease. These lubricants are prepared from the best of crude materials, highly refined and adapted for special uses, the oils being perfectly freed from carbon by filtration.

MISCELLANEOUS.

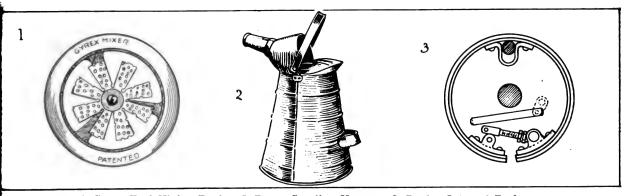
Janney, Steinmetz & Co., Philadelphia, Penn.—Included in the exhibit of this concern was a complete line of the seamless steel tanks which has been a special product for years. These are made in all sizes and capacities, and for all purposes. The tanks are especially adapted for automobile and motor yacht uses because of the great strength and immunity against leakage and defects with assembled tanks. These have been very generally adopted as storage reservoirs for starting devices, tire inflators, air compressors, as well as fuel tanks for motor boats. The spark plugs made by this firm were displayed, as was

he Janney-Steinmetz engine starter, while the Ininciple tire pressure tester was also shown. This auge is designed for application to the valve stem and indicates in pounds pressure to the square inch, indicator remaining fixed when removed so that eading may be convenient. When desired the hand lay be released.

Dover Stamping & Manufacturing Company, Camridge, Mass.—The line of stamped metal products hown by this concern was especially complete. mong those to attract more than ordinary attention ere the motor truck funnels, constructed to endure ard service; the large spout funnels, designed for se with cars having large tank fillers; the Simplex asoline measures, the Duplex measures, and the hermos bottle cases. The Simplex measures are of wo and five-gallon sizes and are intended for tank illing, having a spout at one side and a lip at the ther, so the contents may be poured into containers aving large or small openings. The Duplex measres are of the same type with a side handle and in izes from a pint to a gallon, being adapted for all arposes. The thermos bottle cases are with capacty for two or three bottles, or two bottles and a lunch ox, being a convenient receptacle for a satisfying

filling cuts and punctures of proportions that do not require special treatment. While this will harden sufficiently to resist wear it will retain an elasticity that will be close to that of the rubber compound forming the outside of the shoe. As several hours must elapse before it consolidates fairly with the tire it is not adapted for roadside uses, but is more for use in the garage. With tubes, however, it may be used immediately as the heating of the tires will solidify the compound.

New Departure Manufacturing Company, Bristol, Conn.—The exhibit of ball bearings was the chief feature of this company's display, these being of all sizes from 10 to 110 millimeters bore and in three different types. These are of the double-row type, designed for combined radial and thrust bearings, having two rows of balls; the single-row type, intended for radial loads only ad taking but a slight thrust, and the radax type, having one row of balls and taking radial loads and thrust in one direction. The double-row type is made to 110 millimeters bore, the single-row to 110 millimeters bore, and the radax type to 80 millimers, while magneto type bearings range from 10 to 17 millimeters. The company has specialized in bearings for heavy duty, as with motor



1, Gyrex Fuel Mixing Device; 2, Dover Gasoline Measure; 3, Duplex Internal Brake,

luncheon for a small party on the road.

Royal Equipment Company, Bridgeport, Conn.-This exhibit included several specialties produced by this concern, chief among which was the showing of Duplex brakes, these being of the double-acting type, both internal and external, the internal brake being but recently placed in the market. A glass case contained numerous sizes of Gyrex, this being a small metal fan with six perforated blades mounted in a frame that is fitted into the intake pipe at the joint between the carburetor and engine manifold, its purpose being to revolve and thoroughly atomize the hel as it is aspirated through the pipe into the motor tylinders. Another display was Raybestos, a fabric of asbestos and copper wire used for lining brakes and other surfaces exposed to extremes of friction, which is made in varying widths and thicknesses.

Charles O. Tingley & Co., Rahway, N. J.—The showing made at this display was of a great variety of materials specially prepared for tire repairing, these being in the nature of special forms for patching and preparations of rubber in solution for attaching them. Many of these have been in the market for a considerable period, but a new material is "tire solder," which is in plastic form and intended for

trucks, and for large motors, a large part of the display being devoted to these forms.

Perfection Spring Company, Cleveland, O.—The showing of vehicle springs made by this company included types adapted for all forms of power driven conveyances, ranging from the lightest runabout to the heaviest truck. The springs are made from the best of selected materials, these including vanadium, Krupp and crucible steels, both American and imported. High efficiency is claimed for these springs and it is maintained that this is due to the careful study of the variations resulting under the load stresses with relation to the load line of the machine. The springs are in designs to meet the requirements of different constructions.

Chas. E. Miller, New York City—The showing of accessories, parts and supplies made by this pioneer firm was typical of a house that has 15 branch establishments in the East and South and which is known of all motorists as a jobber, manufacturer, importer and exporter. While there was an exhibit that was decidedly attractive it was but a suggestion of the enormous stock that is carried. There were, however, examples of some of the specialized products, among these being the well known Pan-American

lubricants, these being refined from the finest of Pennsylvania crude oils, double-distilled and highly filtered. Besides these there is the gearcase compound in three densities, all having low cold tests and high melting points. Another specialty is the Pan-American tire repair outfit which consists of a package containing selected materials for tire and tube repairing, either emergency or permanent. The noted Brampton chains, for which Miller is sole American sales agent, were displayed in all sizes and types, these being adapted for both pleasure and power wagon service. Still another product was the tire pump tube covered with a flexible wire armor for use in garages, this protection being sufficient to withstand the weight of any heavy car without damaging the tube.

Coes Wrench Company, Worcester, Mass.-When a company produces nothing but wrenches of standard types, but adapted for all purposes, demonstration is a difficult matter, but this condition was met by this firm by a dial on which were six small wrenches, and in the centre a small nickel plated wrench served the purpose of a hand. This centre wrench or hand was attached to a staff which revolved once a minute, stopping and pointing at one of the wrenches on the dial. This was explained as being a representation of the production of the Coes factory, which turns out a wrench every 10 seconds, 360 the hour and 3600 a day, these varying in size from four to 72 inches in length. These wrenches are of the adjustable jaw or "monkey" type and are guaranteed to represent the highest quality of material and workmanship. endurance of the wrenches was demonstrated by a display of these tools that had been in use in one shop for 22, 35, 26 and 44 years, none showing material wear after so long periods of use. Besides these, series of wrenches of all sizes were shown attached to display tablets.

The Eagle Company, Newark, N. J.—An exceeding attractive display was made by the Eagle Company which showed various types of Standard Friction windshields, these being in size and finish to suit all demands. These windshields are designed with a divided glass and may be adjusted for rain or dust protection or to afford a clear vision of the road, and to have zig-zag or vertical positions. The upper and lower sections are suspended in the frames and are secured in any position by metal ratchets and pawls which are supplemented by friction discs which will hold the movable section in any position. The windshields may be operated by the hand instantaneously and without difficulty by the driver.

Portland Garage Company, Portland, Me.—The garage turntable manufactured by this company was demonstrated at the exhibition of the Brush Runabout Company, where the latest type of Brush car was mounted on one of these devices and was caused to revolve continuously during the time the show was in progress. This was a capital illustration of the ease with which the turntable is operated and its endurance was shown by the continuous operation during the Madison Square Garden show, which much exceeded what might be given in many years of public or private service.

Ross Gear & Tool Company, Lafayette, Ind.— Steering gears and differentials for motor trucks were the features of the display made by this firm, there being shown five models of steering gears for power wagons of from 1000 to 10,000 pounds capacity. The three differential gears shown were for service wagons from 2000 to 10,000 pounds load capacity. One of the features was the new steering wheel which is made in 18 and 22-inch sizes. The spiders of these wheels consist of pressed steel stampings which have a continuous rim. The stamping is made with channel sections in the spokes so extreme strength is obtained. The hub is turned from bar stock and is riveted to the stamped wheel spider. The rim is one piece of bent wood and completely envelopes the rim of the stamping. The wheel is handsome and, having great strength, is claimed to be ideal for motor truck use.

Geiszler Bros. Storage Battery Company, New York City-This company displayed the full line of Geiszler batteries designed for ignition which have been in the market for years, these being of varying capacities, and in addition a series of larger storage batteries especially produced for lighting and start-The latest batteries have all the well ing purposes. known qualities of the Geiszler products and are built for and rated at a high ampere discharge rate. They are guaranteed to be equal to or better than the capacities established and constructed to resist the overcharge such batteries may receive when used in connection with an electric generator. A special quality claimed for the Geiszler batteries is that they are nonsulphating and the plates will not buckle under exextreme discharge. The batteries are made with exceptionally thick cases and strong handles and special terminals which resist corrosion.

Merchant & Evans Company, Philadelphia—One of the features of the exhibit by this concern was the Hele-Shaw clutch, a construction that is known of all motor vehicle engineers and designers. conditions to the recent purchase of four English Daimler cars by the Emperor of Japan was that this clutch would be installed in them. After exhaustive experiments with other makes the company operating the largest cab service in Paris installed this clutch in 1500 cabs. Similarly the clutch was adopted by the London Omnibus Company for its large public service. The Hele-Shaw clutch has been adopted by more than 70 makers of pleasure vehicles and service wagons and more than 80,000 are now in use. Among the truck manufacturers using them are the largest concerns in America. Besides the clutch has been adopted by more than 30 different makers of aeroplanes and dirigible balloons.

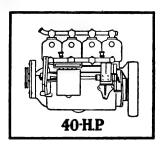
CALIFORNIA CLAIMS SECOND PLACE.

According to the secretary of state in California there were 62,000 licensed cars in the commonwealth Dec. 30, 1911. Inasmuch as the registration is permanent in California, the official may be mistaken, although his statistics show 19,526 cars were licensed during 1911. As the matter stands, the residents of that state claim the second largest number of automobiles in the country, and more than any nation of Europe except the United Kingdom and France. It is estimated that fully 5000 cars are in the state, the property of tourists who carry license plates issued by their home commonwealths.

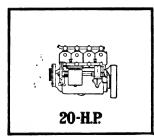
You Buy Specified Horsepower

DO YOU GET IT?

When you buy your automobile you buy a specified horsepower. Yet, the best automobile cannot deliver its power if poor lubricants are used.



In some cases the horsepower is reduced one half because of soot-deposits on valves, cylinder heads, spark plugs, etc.—due to inferior oils—the car instead of being 40 H. P. actually delivers 20 H. P.



HARRIS

TRADE MARK-REG. U. S. PAT. OFF.

OILS

Are as free from the possibilities of soot-deposits as twenty-five years of experience can make them. They



show by actual road and laboratory tests that they resist evaporation by heat to a greater extent than any other known oil. They are positively the best lubricants you can buy.

Protect your big investment with HARRIS OILS. Your dealer sells HARRIS OILS. Ask him. Get a can to-day.

A. W. HARRIS OIL COMPANY

326 So. Water St., PROVIDENCE, R. I.

43 No. Wabash Ave., CHICAGO, ILL.

BODIES AND EQUIPMENT REFINEMENTS.

THOSE visitors at the shows who gave even casual attention to the bodies found in them much that was interesting. In fact the more the bodies were studied the more one became convinced of the careful attention directed toward refining and perfecting, for after all, without the degree of comfort that might be realized, no form of chassis would be satisfying. Generally it is safe to accept without question the statement that to gain speed one must sacrifice comfort, and vice versa, but it is possible in expensive creations to have a very large measure of both elements. Under any circumstances the designer who did not endeavor to secure in his chassis every important requirement would invite, if not precipitate, disaster, so far as public approval is concerned, because it is intensely human to desire every attractive

of the keenest there will be every incentive to produce what will be approved and purchased. Perhaps one of the most striking illustrations may be found in the general design of bodies shown, and in considering this equipment it may be pointed out that with rare exception every one listed as a standard is of enclosed or fore door type. There are many reasons why this design has been given practically unanimous approval, but while it is necessarily more expensive than those not enclosed it is really the only form that is suited for yearly use. The great majority of car owners drive their machines the greater part of the year, and many without regard to weather conditions, and no matter what the season the protection afforded by the enclosed body is decidedly superior to all others. This term, enclosed, is not at this time applied to



Springfield Metal Body Company's Patent Glass-Enclosed Top When Raised to Cover Touring Body—Entrance Is as Convenient as to a Limousine.

quality and to secure that which has the greatest number should there be occasion for a choice.

What has been applied to the chassis applies equally to the body and it should be said with sincerity that without exception there has been unusual progress made in development of what establishes the usefulness of the automobile vehicle. It is not meant to imply that the fullest possibilities have been attained, for in fact it would appear that these were even greater and more inviting for all designers, and the universal approval given would seem to impel greater activity for the future. There is no doubt whatever that the policy of every pleasure car maker is to provide equipment that will appeal to every class, and it goes without saying that with this understood by the public there will be no retrogression.

So far as the people are concerned they will undoubtedly demand a great deal and with the industry on a pronounced commercial basis and the competition

bodies of the coupe, limousine or berline types. It is the matter of comfort that impels body design that will protect one from dust, mud, rain, wind, cold, or any other condition that can be avoided. With cars used for more extended travel each year there is the fullest appreciation of convenience and the minimizing or elimination of causes for annoyance. There is no possibility of any manufacturing economy being adopted that would mean a sacrifice of patronage.

The very general adoption of the enclosed or fore door body type has also had an effect of changing the position of the control levers, which seemingly had been permanently located at the right side of the chassis frame. With the need of mounting the levers firmly and with a very large proportion of drivers right handed, the right side appeared to be the logical installation, despite the very cogent reasons of those who advocated left side control. The levers and the carrying of spare shoes at the right side practically

precluded the use of that side for entering or leaving the driver's seat, and with some designers it was believed wise to efiminate a door on this side when the enclosed body was adopted. Not only this, the closing of the right side necessitated bringing the levers inside the car where they could be reached easily and could not be confused, and where they would be out of the way. Others have gone further and placed the control levers in the centre of the car, this being now a very general practise when the machine is driven from the left side, this to make possible easy entrance or egress from either side of the driver's seat. While the greater number of cars now have right side drive there is no question of the growing tendency to place the control levers amidship between the front seat passengers, which seemingly has not been criticised and appears to be very generally approved.

One of the results of the centre installation of the control levers has been to materially lessen the swings, because of the shorter lever arms and the desire to prevent obstruction of free passage from the

the windshield. The forms of ventilators differ, some of them being of the shutter and others of the diaphragm type in which the openings may be varied to meet requirements. As a rule these are not crude in appearance and many add decidedly to the design.

Among the features that are emphasized by the designers in 1912 cars is the wheelbase, which has been with few exceptions increased. With some the change has been considerable, and this means lengthened bodies, affording more leg room for the passengers, greater space for luggage carrying, and more opportunities for the utilization of locker room. Not only this, there is the added comfort that can only be obtained with greater length. The long wheelbase automobile is no experiment and there is no reason for the motorists to do anything else than approve this character of development. The springs as a rule are longer and heavier and straighter, this applying to the semi-elliptic and three-quarter elliptic types, while the full elliptic forms are often similarly improved. It might be stated that there has been quite as much attention given to the improvement of



Springfield Metal Body Company's Patent Body with Folding Top Uncovered and Ready for Raising, and Window Frames for Front Doors Raised,

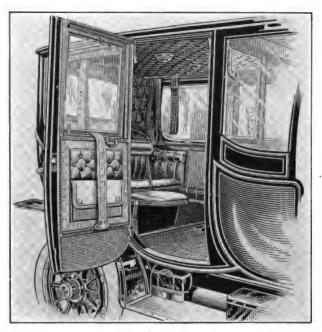
one side to the other of the car, which now appears to be considered a necessity by many designers. Another form of construction that has been adopted by several is the use of the clutch pedal to apply the emergency brake by "passing through" after engaging the clutch, this disengaging the clutch as the brake is applied. The claim for this, that the driver need not take his hands from the steering wheel when he may require all his strength and skill, is entirely valid and the form appears to meet with approval.

With the adoption of the enclosed form of body the heat from the motor, and often the muffler, under the floor of the front seat made it not only desirable but necessary to install ventilators which would cause drafts of air in the spaces above the floors. Naturally the requirements are variable and it is interesting to note how the designers have worked out such installations. The very generally accepted position is in the dash, at either side of the hood, but with some the ventilator is installed in the scuttle dash beneath

the suspension of the chassis as to any other detail of construction. Incidentally this will result in increased comfort and satisfaction, and surely decreased maintenance expense.

Much ingenuity has been manifested in the utilization of space in the bodies and about them for the carrying of tools and equipment. This economy can always be approved, for there is nothing more pleasing for a motorist than to have the room to carry his tools, supplies and equipment where they may be reached without delay and may be replaced with equal ease after use. This is especially true of machines that are used for touring, when space is at premium and it might be necessary to overhaul a carefully packed compartment to secure something that ought to have been convenient. For instance, in Knox cars the splash aprons or skirts between the running board and the body are converted into receptacles in which many tools and other necessaries may be stored. A very similar utilization is made with

the Oldsmobile cars by filling in the same space with a squared, instead of tubular, series of boxes, this construction also being useful as a step. The Overland



Sketch Showing the Interior of Stevens-Duryen Berline Finished in Wildwood Violet—A Splendid Creation.

design makes use of shallow trays carried beneath the running boards and the Lozier machines have a tank case and step combined. The Columbia-Knight cars have tire carriers installed at the rear of the tonneau, under the wing formed by the back of the seat, and outside of this is installed the trunk rack. In the Thomas cars there is a space arranged under the forward seat so that the side curtains may be rolled and carried safely from crushing, which has been known to damage the celluloid lights. The arrangement of the tool boxes has been with a view to giving increased storage and quite frequently cases have been adapted for the carrying of the gas tanks.

Some of the designers have increased the width of the running boards and the mudguards, these giving greater protection for the passengers in the event of storm and the former being more satisfactory to elderly persons who have occasion to enter or leave the machines. Many of them have cleared the dashes of gauges, indicators, sight feeds and the like, and in several these installations are mounted on what might be described as "gauge boards" carried directly below the skirts of the windshields and close to the tops of the cowls of the torpedo or scuttle dashes. This has been brought about by the inaccessibility of the instruments when placed under the cowls and on the dashes proper.

It has been pointed out that the wheelbase length of the cars has as a rule been increased, and this has in turn impelled the use of larger wheels and tires, though it does not follow that the cross section area of the tire is greater. There is no question that with the larger wheel is realized a more decided comfort, especially over roads that are not smooth, a very potent factor in touring. Many of the largest and

best machines have this improved wheel equipment and it is maintained that there ought to be no increased tire cost because of the lessened wear of the shoes resulting from a decrease of wheel revolutions. It will not be denied that this is sound argument and slower engine speed ought to have a material effect as well.

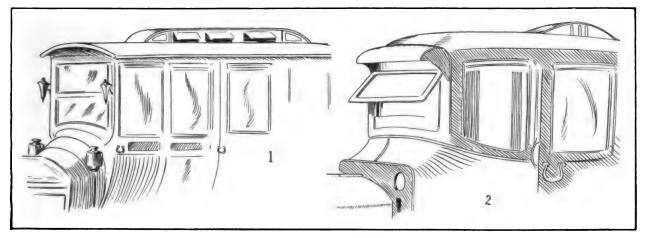
Of the cars exhibited at the shows many have regular or optional starting devices, which employ varying forces for turning over the engine. The machines so equipped range from those comparatively low priced to the most expensive, there being no line of demarcation as to this equipment with reference to cost. These starting mechanisms or apparatus are generally guaranteed to do the work under any circumstances with the motors in normal condition and to be in every way efficient. These devices include those actuated by springs, by hand levers, by foot levers, by pedals, by compressed air, by compressed exhaust gas, by positive priming with mixtures of gasoline and air, by acetylene gas and by electric motor driven by the storage battery. Some of these are creations of the designers of the cars, others are produced commercially and may be utilized by the owners of many machines, while with some special construction is necessary to use them.

There is no question of the popularity of such attachments and the cars so equipped received more attention as a rule than did those without them. The fact that the driver might start his machine from the seat with the same ease that he stopped it, without reference to temperature, heat, cold, wind, rain,



Interior of Waverley Electric Limousine Upholstered in Rose and Gold Brocaded on Fawn, and Finished with White Enamel and Ivory and Gold Plate.

mud or any other form of annoyance, and without danger of injury through careless cranking, to say nothing of the elimination of the manual labor in-



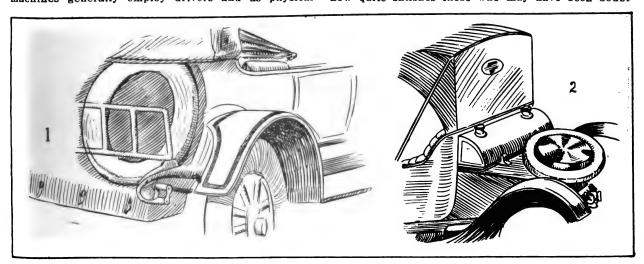
Specialized Ventilation of Enclosed Bodies: 1, Monitor Roof Effect of the Alco Limousines; 2, Fixed Ventilator of the Artistic Marmon Model.

cident thereto, has appealed strongly to many. It is not at all surprising that some of the really low priced machines have such equipment, and a majority of those so equipped are what may be regarded as moderate in price, while with the highest cost cars generally the purchaser may secure such installation at pleasure.

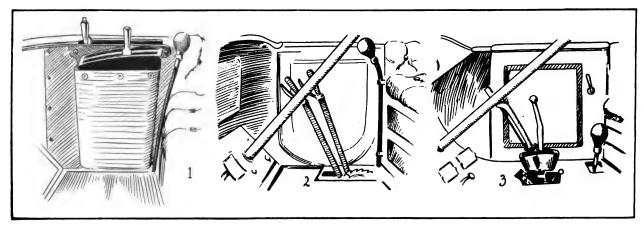
There are several reasons for this condition, one of which is that one class of vehicles are adapted for the use of professional and business men who desire to stop and start their engines frequently while the machines are in service, for the use of comparatively young people who may not have the inclination or strength to crank the engines, for the use of women who desire to drive their own cars, and for the use of elderly people who might fear the result of the exertion of starting a motor. Those who might be regarded as coming within the categories mentioned are legion, it is true, and with the desire to attract the attention of the largest number the self-starting engine has been offered as a "popular" feature or Those who purchase the higher priced machines generally employ drivers and as physical qualifications are usually considered necessary the real labor of starting is not so seriously regarded by the buyers who do not drive as with those who drive their own cars.

The number of women who would drive cars were they strong enough to start the engines is very large, because cranking effort has been regarded as imperative, but with the starting equipment this obstacle to their pleasure has been in every way overcome. In fact from the point of view of those who have regarded cranking as a deterrent to the use of the automobile it is held that with any reliable starting device a gasoline car may be started with no other effort than engaging the clutch and changing the gear ratio, a work that any child could perform.

For lighting the cars electric illumination has made a very great stride and it can be said that this appears to be a condition that has met with practically unanimous approval. It is not necessary to discuss conditions to emphasize the merit or quality of electric lamps. There are innumerable advantages and a degree of reliability has been established that now quite satisfies those who may have been doubt-



Advanced Methods of Carrying Spare Tires: 1, Placed Under the Rear Wing of the Columbia-Knight Models;
2, Located on the Deck of the Stevens-Duryea Runabout.



Specimens of Lever Control: 1, Enclosed Lever Arms of the Buick Models; 2, the Arrangement of the Maxwell Levers; 3, Location of the Flanders Levers and Horn.

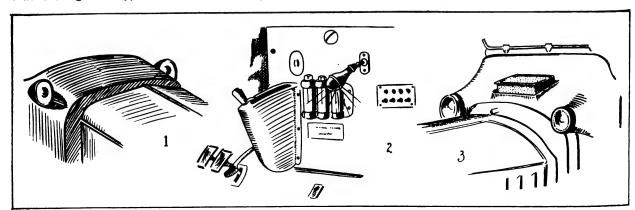
Unquestionably there has been great progress made and this with reference to every phase of illuminating. With many of the machines the electric current is used for lighting the dash and tail lamps, and gas from a tank or generator for the head lamps, the energy being furnished by a storage battery that may also be used as a reserve for ignition purposes, or for starting the engine. With others the lighting is from a battery kept stored by a generator driven by the motor, the generator being cut out automatically when the battery is charged and being as positively set at work when the battery is drawn upon. This form has been modified and adapted for use with dynamos, magnetos, magneto-generators, and other energizers, and with varying systems of wiring. While a storage battery would serve to light the dash and tail lamps obviously it would necessarily be very large and cumbersome were it used to illuminate all lamps, and this has impelled the service of the mechanical generator which obviates the necessity of charging and insures against possibility of failure of current.

The electric is the light of today with the automobile as in any other form of service. With its advent has vanished many of the annoyances and inconveniences of the oil lamp or gas from a generator, and there is a considerable element of economy in that the lights may, with most machines, be used

with reference to the needs and be turned on or extinguished instantly. To illustrate, to have to stop and alight to dim or extinguish a head lamp usually means burning it, while a touch of the finger tip means positive control with the electric. There is the cleanliness as well that is a large factor in its favor, and the construction is quite as enduring as any other. But one of the conditions that is not so generally regarded is the safety of the electric as compared with any form of open flame when there is fuel leakage or an accumulation of gasoline. Not only this, the car can be worked on at any time during darkness by aid of an inspection lamp, and just as safely as in the day. The light is better and it can be placed anywhere. By a trifling additional wiring lights may be installed to show the oil feeds and the gauges. In fact, there is no limitation to the uses that may be made of electrical lighting, although it may be said of some of the higher priced cars little appears to have been neglected where such illumination would serve.

Where the electric lighting and starting equipment has been combined it is held that this is ideal. As all may be controlled from the same generator and battery and with minimized wiring there would appear to be an excellent foundation for this assumption.

Relative to lamp construction there has been ma-



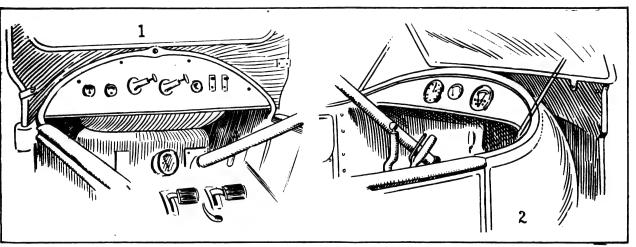
New Ideas of Lighting, Ventilating and Starting: 1, Installation of Lamps on Dash of American Models; 2, Lever Controlling Starter of White Machines; 3, Ventilator and Lamps Distinctive of Oldsmobiles.

terial progress made and there are designs that seemingly have everything to recommend them and should endure for a long time. There is careful adjustment of the mirrors to intensify and project the light rays, to economize the illuminant, a condition more required with electric lamps than with open flame. The lamps are located with a view to better protection against damage, and taken all in all there is much to be approved in the lighting of the cars as a whole. Some of the less expensive machines still have combination oil lamps which are distinctly an improvement as compared with the installation of previous years.

Taken throughout the upholstery and carriage trimming work on the cars is decidedly improved. There has been perceptible betterment in every detail that would make for comfort, while appearance has not been overlooked. For instance, the seat backs are deeper and easier and the seat cushions have been correspondingly increased, with abundant springs and covering, minimizing fatigue and permitting more changes of position during extended In the large and higher priced vehicles the

There were the Pierce-Arrow limousines with the roofs slightly arched above the door, this making for easier entrance of the passenger with a large or towering head covering, or of extreme height. The appearance of this departure from conventional lines was extremely pleasing and it was regarded as a desirable feature in closed vehicles. Both of these were admirable specimens of coach work and the colors were maroon and black.

Another body that attracted much attention among the gasoline cars was the Alco berline with a typical monitor roof in which the small windows may be adjusted to secure any degree of ventilation without creating a draft directly about the passengers. This body has three windows in the back, affording practically an unobstructed view behind for the driver. The drop windows in the doors are equipped with regulators which will permit adjustment at any height with safety. The car is fitted with disappearing electric reading lights, such as have been used in Pullman cars, and there are electric lamps that are automatically lighted when the doors of the passenger compartment are dpened, so the steps may be per-



Gauge Boards to Convenience Dash Fittings: 1, Handy Installation of the Thomas Cars; 2, Sightly Utilisation of the Dash Cowl on Knox Models.

luxury of the seats is pronounced and with the other qualities that make for easy riding it may be said that little else could consistently be sought by the most sensitive and exacting motorist.

The best examples of upholstering may be found in the enclosed cars, such as limousines, coupes, berlines, and the like, which have been finished with a view of especially adapting them for the use of It is needless to say that in every respect women. what will appeal to femininity has been regarded Studied elegance has brought about and adopted. some striking creations in which the upholstery is in harmony, every detail adding to the effects. While some of these are extremes which would hardly be chosen with reference to the effect of service upon appearance, yet as examples of highest workmanship and art of an entirely commendable character these vehicles are surely deserving of praise. One of the touring vehicles was a Packard phaeton finished in black and deep Derby red, the front seats in leather and the tonneau in broadcloth of the same tone of red. This machine was with all bright parts nickeled.

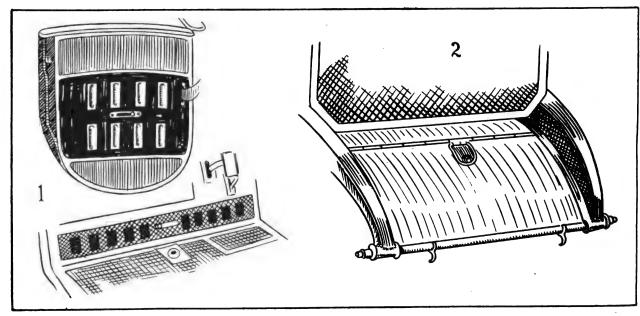
fectly visible while the motorist is about to use them.

The Marmon limousine designed for four passengers is a development of the coupe type in that the doors are located in the centre of the sides and there is a suggestion of a scuttle dash, above which the front of the body rises and the sides sweep away in graceful curves. Over the swinging section of the front there is a tiny shapely bonnet that partially protects the glass from the elements. The roof is pronouncedly crowned and in the centre is a ventilator with movable shutters. The interior of the car is charming with woodwork of bird's-eye maple and fawn color broadcloth. The dash lamps of this car are so fitted that they may be tipped backward to light the interior, a decidedly ingenious arrangement.

A Stevens-Duryea berline that attracted much attention and admiration was that finished in a color announced as "wildwood violet," a tone of pronounced elegance that was enhanced by ivory white striping. The body is upholstered in embossed doeskin with delicate outlines in the body color. The windows are draped with silk and lace curtains and in addition the fittings include a robe and coat rail, speaking tube, glove tray and mirror, water and toilet bottles, flower vase, card tray and case, electric cigar lighter, umbrella holder and cup, watch, note book, and all the accessories for lighting. It is said of this car that the decorations necessitated a man making a special trip to Europe to perfect the details of this design.

The attention of those who gave especial scrutiny to the electric vehicles was directed toward a Waverley electric five-passenger limousine, this also resembling a coupe with its single side doors. The machine has wheelbase of 104 inches and total overall length of 144 inches. The design of the body is based on a town chariot of the first French empire. The decorations of the car were created by Frederick Richardson, a noted New York and Chicago artist. The exterior is finished in black with gold lines, gold plated lamps and white wheels and window frames. The interior is upholstered in fawn color brocade of Louis

novel from every point of view. While this is in appearance an open touring equipment of conventional design it may in a very brief period be converted into an entirely closed body, suited for use under all conditions of weather. With the body open there is a folded top carried under a dust cover and a windshield mounted on the scuttle dash. The windshield has a heavy frame and is not divided. body has the usual side doors for the front and rear seats that are not unlike those of the average closed car with drop door windows. In these doors, concealed by heavy padding are recesses into which windows fold and are concealed by leather covers or flaps that button down. When the door windows are raised they are spring retained. At three positions at either side, which may be noted in the illustration, are sockets in the side of the body open at the inner side. At the back of the front seat is a padded pocket or case into which four windows in their frames are carried when the equipment is used in its open form.



Some Attentions That Make for Comfort: 1, the Ventila ted Front Door and the "Foot Warmer" of the Oldsmebiles; 2, Splash Apron to Protect Radiators Against Mud on Inter-State Machines.

XVI's period design with ornamentation of rose and gold. The ceiling instead of being covered with fabric is painted ivory white with a border design in rose and gold suggesting the pattern of the brocade. Metal work of the interior is gold plated and white enamelled, while the door and lever handles are of elephant's tusk ivory. The entire detail of the finish has been carried out to harmonize with the Louis Seize tapestry that was the motif of the general design. The lamps are cut glass with gold mountings of an acorn pattern, these including a dome light, two bracket lamps and a meter lamp, while there are lamps to illuminate the steps when the side doors are opened. Head, dash and tail lamps are all of a pattern to harmonize with the general design of the car.

One of the bodies for cars that came in for a decided attention is that built by the Springfield Metal Body Company, Springfield, Mass., which is new and

The body being open it is desired to raise the top. The dust boot is removed and the top is free. The top frame folds and it is lifted and the forward end carried to the windshield, where it is attached securely. The six side stanchions or frame members are dropped into the sockets in the sides of the body and are held by sockets at the bottom, and are attached to the top frame above. With these secured the top has the appearance of the usual covering, there being straight supports at the sides instead of the usual bows at varying angles, more or less restricting passage to and from the car. The form of the top proper is sightly and is in keeping with generally accepted designs.

From the pocket at the back of the front seats the four window frames may now be taken, should there be dust or rain or cold, and placed in the openings between the side members, where they are secured by winged nuts that are easily manipulated.

With the windows in place the entire body, with seven occupants, perhaps, may be enclosed so as to give the best of protection against any untoward condition and the passengers may leave the car or enter it at will through the doors. The car is in every sense enclosed and may be used as such as long as desired, while it may be converted into an open car in a very brief space of time by a reversal of the process that has been described. The windshield swings from the top in its frame and affords any degree of ventilation and it may be cleared of accumulations of water or snow by the use of a scraper. The fabric top does not serve as a sounding board as does the solid roof of an enclosed body and conversation may be made by the passengers without inconvenience in ordinary tones.

While the top may appear novel it is stated that it has been tried out during the period of perfecting for several years and under all conditions of service. It has been found to be as serviceable as has been stated and the construction has endured.

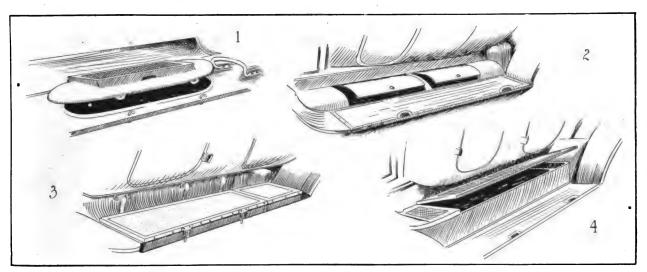
As to body finish there is no question that the

demonstration of progress that is as apparent as it is convincing. But best of all is its promise for future development.

FACTORS IN LUBRICATION.

Several important factors enter into the lubrication problem, although few motorists give the subject but passing notice. In addition to filling the microscopic pores of the metal and serving as a separating medium between the frictional surfaces, the oil should have body enough to prevent its being squeezed out, and yet not heavy enough to permit the parts to bind. A third factor is heat resisting qualities. A fluid that is suitable as a cylinder lubricant should have a high flash point, which term is designated as the temperature at which the heated oil will ignite. Oil that is adapted to one form of motor is not necessarily suited to another, nor will that intended for engines be effective in transmissions. Lubricants vary with the uses to which they are intended.

The laboratory of the Havoline Oil Company, New



Examples of Highly Economized Stowage Space: 1, Losier Combined Tool Box and Step; 2, Compartments in Knox Running Board Aprons; 3, Convenient Trays in Running Boards of Overland Cars; 4, Spacious Locker of the Oldsmobile Machines.

works displayed indicated a higher class of workmanship as an average. The coach work of the high priced cars as a rule compared in every way favorably with what have been regarded as European standards. There is no question that quite as good finish can be obtained in America as abroad and the only element that is uncertain is the quality that is consistent for each grade of car, for cost is the determining factor. Without doubt the purchaser desires the best that can be obtained so far as appearance is concerned, and the creation of a standard that will satisfy and endure is now the ambition of every car manufacturer. Judging from the exhibits it would seem that finish was another factor in competition that had been carefully considered and which was regarded as having material influence upon demand. This does not mean that the low priced machines have more appearance than merit, but it is intended to emphasize that good value—better value than ever before-is represented in all lines of body work, a York City, is thoroughly equipped for the purpose of testing lubricants. Oils and greases of manifold consistencies are tested under normal surface conditions, and others compounded according to processes known to the manufacturers themselves. The business of making and selling lubricants has become an industry in itself, and has contributed materially to the success of the modern automobile.

WILL BUILD POWELL TRUCKS.

Power wagons of 3000 and 4000 pounds capacity will be built by the Powell Engine Corporation, Brooklyn, N. Y., which will be driven by Brownell unit motors of 25 horsepower. The vehicles will have mainly components of standard types with a special radiator original with the builder. The Powell concern has long been engaged in automobile and marine engine construction.



MOTORING NEWS OF NATIONAL IMPORT.

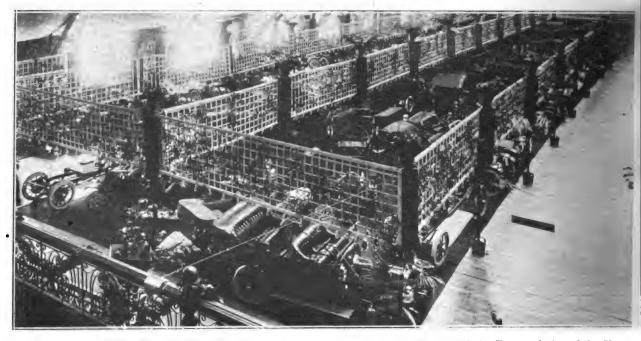
Providence Revives Annual Show With Splendid Success---Toledo, O., Philadelphia, Peoria, Ill., Detroit, Milwaukee and Salem, Mass., Also Hold Displays---Plans for Boston and Other Cities.

After a lapse of four years the automobile show in Rhode Island was revived, Jan. 22-27, by the first annual exhibition of the Rhode Island Licensed Automobile Dealers' Association in the State Armory. The reception accorded by the people is sufficient indication that the practise of permitting inspection of the various models under one roof will not be abandoned again.

The management of the affair was under the di-

Knox, finished in natural wood colors, shown by the Hitchcock-Banks Motor Car Company, which also divided its exhibit between the pleasure and commercial sections. Still another make that was seen on both floors was the Pierce-Arrow, shown by the Foss-Hughes Company. The worm driven truck was of particular interest.

Among those who made display of more than one line, may be mentioned the Pawtucket Auto Com-



Interior of State Armory, Providence, R. I., During the Progress of the Recent Automobile Show.

rection of Arthur S. Lee, who was responsible for a decorative scheme which will linger long in the memory even of those who have been attending shows of national prominence for a number of years. The setting was that of an open air palm garden with blue sky overhead, in which hundreds of tiny electric lights twinkled as the stars of the evening. The exhibition spaces were set off by white lattice work entwined with southern smilax, and palms were used liberally throughout.

Many of the vehicles on display had been shipped direct to Providence at the conclusion of the New York shows. This was true of the White polished chassis with bird's-eye maple trimmings, shown by the White, Binford & Robinson Motor Company, which not only presented White pleasure cars in the main hall, but had a very complete line of trucks in the basement as well. Another New York car was the

pany, with Garford, E-M-F and Flanders; Maxwell Sales Company with Maxwell and Columbia-Knight; Pugh Bros., with Overland, National, Marion, American, Palmer-Singer and Metz, not to mention the Morgan truck in the basement.

A particularly complete line of Corbin cars, including all of the four models, was seen at the booth of Arthur S. Lee, while across the aisle was the exhibit of the Hudson with three complete cars and a chassis in white, this being the display of L. B. Lorimer. J. J. Nugent called attention to the famous friction drive of the Cartercar. E. E. Whipple showed two models of the new R. C. H. as well as a chassis. The Davis Automobile Company presented the Peerless, as well as two other makes, including the Gramm truck in the basement. The Warren and Lexington were shown by the Nock Automobile Company.

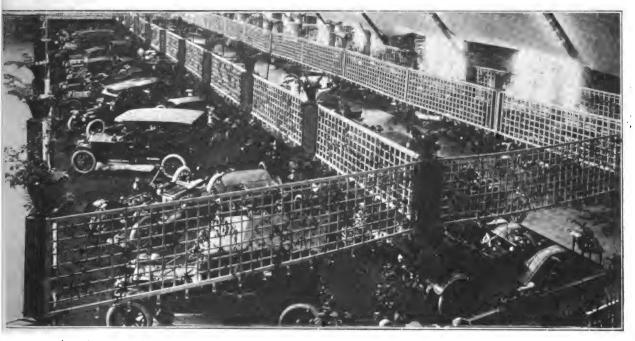
J. S. Harrington & Co., had a most attractive dis-



play of Everitt and Thomas cars, the former line being very complete in every respect. The Fiat Automobile Company of Rhode Island presented the new six-cylinder Fiat. The Speedwell was represented by four models; the Oakland by a touring car, roadster and chassis; the Marmon by four machines and a chassis; the Hupmobile by three models, and the Abbott-Detroit and Brush also were well represented.

A second Knight-engined machine was the Stoddard-Dayton, shown by the Providence Motor Car Company. The self-starting Inter-State was represented by three models, the Haynes by three, and the KisselKar by five, one of these being a truck in the basement. The William Hughes Company displayed two Reo pleasure cars in the main hall and two delivery wagons of the same make downstairs. Although obliged to secure space in the basement, R. G. Davis and Charles Barre had a very representative showing of the Lenox.

Pleasure cars-White, Binford & Robinson Motor Company, White; Hitchcock-Banks Motor Car Company, Knox; Arthur S. Lee, Corbin; Maxwell Sales Company, Maxwell, Columbia-Knight; Foss-Hughes Company, Pierce-Arrow; Providence Motor Car Company, Stoddard-Dayton-Knight; Pawtucket Automobile Company, E-M-F, Flanders, Garford; Pugh Bros., Overland, Marion, American, National, Palmer-Singer, Metz; Capitol Motor Company, Hupmobile; Peleg Brown Company, Oakland; L. B. Lorimer, Hudson; Speedwell Company, Speedwell; J. J. Nugent. Cartercar; Whitten Motor Vehicle Company, Abbott-Detroit, Brush; E. E. Whipple, R. C. H.; Fiat Automobile Company of Rhode Island, Fiat; William Hughes Company, Reo; KisselKar Company, KisselKar; R. G. Davis & Charles Barre, Lenox; E. A. Duer, Haynes; Davis Automobile Company, Peerless, Winton, Locomobile, Chalmers; C. H. Goodwin, Inter-State; J. S. Harrington & Co., Everitt, Thomas; Marmon Motor Company, Marmon; Nock Auto Company, Lexington, Warren; John O'Donnell, Premier; Aetna Bottle & Stopper Company, Buick; Frank J. McCaw Company, Alco, Stevens-Duryea; W. L. Wilcox, Franklin; Cadillac Auto Company, Mitchell; Dayton-Knight; Pawtucket Automobile Company, E-M-F, Rhode Island, Cadillac; Mitchell Auto Company, Mitchell; North End Garage, Elmore; Rhode Island Motor Car Company, Pope-Hartford; Alvan T. Fuller, Packard; Higgins



Indicating the Beauty of the Open Air Palm Garden for the Pleasure Car Display on the Main Floor,

While it is impossible to give the exhibitors the mention their merit deserves, it will be sufficient to say that each representative did his utmost to bring the special points of his product to the attention of those who visited the display. It ought to be added that the Teel Manufacturing Company of Medford, Mass., presented its new Teel-Woodworth truck, which was not among the machines shown at New York.

The basement display also included a number of motorcycle and accessory exhibitors, including B. A. Swenson with Indian mounts, Hirah G. Baxter with the Excelsior and the Elmwood Cyclery with the Harley-Davidson. Special mention should be made of the display of Kincaid oils and greases, made by the Kincaid Oil Company; Waite specialties, etc., by the Waite Auto Supply Company; Ford devices by the Auto Parts Company, and Wayne oil tanks and pumps by J. A. Welch. The full list of exhibitors and the products they displayed follows:

Motor Car Company, Stearns-Knight; Stanley Motor Carriage Company, Stanley; K, Bostel, Baker electric, Commercial vehicles—White, Binford & Robinson Mo-

tor Car Company, White; Hitchcock-Banks Motor Car Company, Knox; Foss-Hughes Company, Pierce-Arrow; KisselKar Company, KisselKar; The William Hughes Morgan; Reu; North End Garage, Chase; Pugh Bros., Morgan; American Locomotive Company, Alco: Autocar Sales & Service Company, Autocar; Alvan T. Fuller, Packard; B. F. & A. W. Hopkins, International Harvester; Davis Automobile Company, Gramm; Rhode Island Motor Car Company, Pope-Hartford; Teel Manufacturing Company, Teel-Woodworth.

Motorcycles—R A Swarze V. V. Company, Reo; North End Garage, Chase; Pugh Bros.,

Motorcycles-B. A. Swenson, Indian; Elmwood Cyclery,

Harley-Davidson; Hirah G. Baxter, Excelsior,
Accessories—Kincaid Oil Company, Kincaid oils and

greases; Waite Auto Supply Company, specialties and full line; J. A. Welch, Wayne oil tanks and pumps; American Fidelity Company, insurance; Auto Parts Company, ican Fidelity Company, Insurance; Auto Parts Company, Ford accessories; Brictson Manufacturing Company, Brictson treads, etc.; B. S. Clark, automobile directory; The Automobile Journal; Maryland Casualty Company, insurance; Class Journal Company; B. F. Greene, automobile clothing; The Horseless Age; Narragansett Chemical Company, oils, greases and batteries; Post & Lester Company, accessories; Pyrene Company of New England, fire extinguishers; Frederick H. Read, magazines; Salisbury & Nightingale, tubing; Scott & Farrell, insurance.

TOLEDO'S THIRD ANNUAL EXHIBITION.

When the doors of the Terminal building in Toledo, O., swung open upon the third annual week's show of the Toledo Automobile Dealers' Association, the evening of Jan. 15, the thousands of visitors from that city and vicinity were invited to inspect a week's display of 1912 models which has not been surpassed anywhere in Ohio. By the expenditure of \$10,000 the show committee had transformed the interior of the building into a Venetian garden.

The estimate of the total value of the cars shown was \$500,000. There were 60 different makes, and the people of Toledo never had better opportunity to study the comparative merits of the machines. The success of the venture was due largely to the untiring efforts of the show manager, Hugo V. Buelow of De-

Comprehensive Exhibit of White Trucks in the Foreground of the Commercial Vehicle Section at Providence.

troit. The list of exhibitors and their displays follows:

Pleasure cars—Atwood Automobile Company, Overland, Marmon, Garford, Waverley electric; Banting Machine Company, Paterson; Auto Exchange, Regal; Rambler Motor Sales Company, Rambler, Detroit electric; Northern Ohio Motor Company, Metz, Palge-Detroit, Brush; Motor Car Sales Company, Abbott-Detroit; Lichtie Automobile Company, Cadillac; Blevins Auto Sales Company, Flanders, E-M-F, Flanders electric; United Motor Toledo Co., Maxwell, Sampson, Columbia-Knight; Roberts Toledo Auto Company, Ford; Crist Motor Sales Company, Cole; United Garage Company, Knox; Home of the Mitchell, Mitchell; Marathon Toledo Sales Company, Marathon; Toledo Motor Sales Company, Hudson, K-R-I-T; Stoddard Toledo Company, Stoddard-Dayton-Knight, Stoddard-Dayton, Courier-Clermont; Union Supply Company, Pierce-Arrow, Chalmers; John Lauer, American; Michigan Buggy Company, Michigan; Standard Auto Company, Packard; H. J. Adams, Reo, Stearns; Hupp-Yeats Sales Agency, Stearns-Knight, Hupp-Yeats electric, R. C. H.; Grasser Motor Company, Elmore; Bowersox Motor Sales Company, Elweritt; John Johns, Zimmerman; White Company, White: Ford Bros, Auto Sales, used cars.

Commercial vehicles—Atwood Automobile Company. Overland, Garford, G. M. C., Federal; Banting Machine Company, Grabowsky; Rambler Motor Sales Company, Detroit electric; Northern Ohio Motor Car Company, Brush; Blevins Auto Sales Company, Gramm; United Motor Toledo Company, Sampson; Roberts Toledo Auto Company, Ford; H. J. Adams, Reo; Grasser Motor Company, Lauth-Juergens; Shop of Siebert, Siebert; McCreery Manufacturing Company, Oliver; James P. Locke, Adams; Merrill Company, Kelly.

Accessories—Wayne Oil Tank & Pump Company, Toledo Sporting Goods Company, Harvey Lubricator Company, Reinforced Welding Company, Cook Manufacturing Company, Electric Auto Lite Company, Miller Storage Battery Company, Toledo Auto & Garage Company, Dahl Punctureless Tire Company, Standard Oil Company, Consolidated Manufacturing Company, Auto Exchange, Ray-Kuhn Company, Paragon Refining Company, Toledo Rubber Company, Union Supply Company, Disco Auto Self-Starter Company, McNaul Auto Tire Company, C. Z. Kroh Manufacturing Company.

TWO WEEKS FOR PHILADELPHIA DEALERS.

With the single exception of the Stanley steam car,

gasoline pleasure vehicles were shown exclusively at the first week of the Philadelphia Automobile Trade Association in the First and Third Regiment armories, Philadelphia, Jan. 13-20. This is the second year in which the show in the Qauker City has been held two weeks instead of one. The second division for electric pleasure cars and commercial vehicles was held Jan. 22-27. The management of both sections was under the direct charge of J. H. Beck.

Both buildings were profusely decorated with bunting, artificial flowers and foliage, and lighted with hundreds of electric lights. Several of the exhibits were direct from the big shows in New York City, and the people of Philadelphia and vicinity gave abundant evidence of appreciating the opportunity to study the 1912 models at close range. Business men were particularly interested in the industrial transports. Accessory dealers maintained a display in the Third Regiment Armory throughout both weeks. An itemized list of those exhibiting follows:

Pleasure cars, First Regiment Armory—Cartercar Motor Company, Cartercar; Continental Motor Car Company, Speedwell; W. Wayne Davis Company, Everitt; Eldredge Company, Garford; Ford Motor Company, Ford; G. H. Gantert, Stearns; Gawthrop & Wister, Elmore, Brush; D. Walter Harper, Case; Hupp Corp., Philadelphia Branch, R. C. H.; Imperial Automobile Company, Imperial; Thos. B. Jeffery & Co., of New York, Rambler; E. C. Johnson Company, Reo, American; Locomobile Company of America, Locomobile; Matheson Automobile Company, Matheson; Mercer Automobile Company, Mercer; Motors Distributing Company, Kisselkar; Oakland Company, Overland; Standard Motor Car Company, Velie; Stanley Motor Carriage Company, Stanley steam; Seltzer & McCowen, Firestone-Columbus; Studebaker Bros. Company, E-M-F, Flanders; Tioga Automobile Company, National, Hupmobile, Nyberg; United Motor Philadelphia Company, Maxwell, Columbia.

Pleasure cars, Third Regiment Armory—Abbott-Detroit Motor Company, Abbott-Detroit; Automobile Company of Philadelphia, Marmon; Automobile Sales Corporation, Peerless, Cadillac; L. J. Bergdoll Motor Company, Bergdoll; Buick Motor Company, Buick; Chadwick



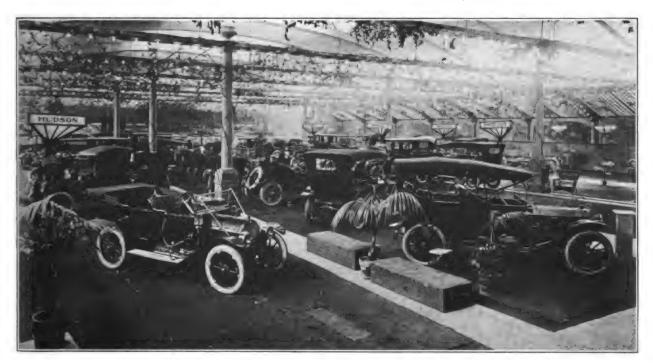
Engineering Works, Chadwick; Chalmers-Hipple Motor Company, Chalmers; Colt-Stratton Company, Cole; Flat Automobile Company, Flat; Foss-Hughes Company, Pierce-Arrow; General Motor Car Company, Lozier; Gomeroy-Schwartz Motor Car Company, Hudson; Johnson Motor Car Company, Haynes; Longstreth Motor Car Company, Alco; Mitchell-Lewis Motor Company, Mitchell; North Philadelphia Automobile Station, Knox; Oldsmobile Company of Pennsylvania, Oldsmobile; Packard Motor Car Company, Packard; Paxton-Crumley Automobile Company, Warren, Marquette; Pope-Hartford Sales Corporation, Pope-Hartford; A. G. Spaulding & Bro., Stevens-Duryea; Stoddard-Dayton Automobile Company, Stoddard-Dayton; White Company, White; Winton Motor Carriage Company, Winton.

Accessories, Third Regiment Armory—Auto Equip-

Accessories, Third Regiment Armory—Auto Equipment Company, supplies; Brown Auto Top Company, tops; Harry A. Devlin, tag carriers; Lenhart Manufacturing Company, burners; Manufacturers' Supplies Company, full line; Chas. E. Miller, full line; Murray, Nolan & McClinchey, heaters; Tokhelm Manufacturing Company, gasoline tanks; United States Motor Tire Company, tires and Bosch magnetos; Vulcanizing Company, tire repairing and tire accessories; J. Eavenson & Sons, soaps and

cars were well placed, and the fact that the structure was warm as toast aided materially in bringing out the crowd. The list of exhibitors included the following:

Staver Auto Company, Staver; W. H. Colean, Broc electric; J. E. Whitten, Moline; Cummings & Rutherford, Overland; MacKimer & Pinkerton, Ford, Haynes; A. C. Warner, Metz; L. R. Caldwell, Reo; J. E. Deckman, Selden; Avery Company, Avery truck; W. P. Walker, Detroit electric; Peoria Auto Company, Franklin, Regal, Waverley electric, Chase truck; Hauser & Hoten, Mitchell; Crown Auto Company, Stearns; Bartholomew Company, Glide; Cadillac Auto Company, Cadillac; M. M. Baker & Co., Packard, Velle, Abbott-Detroit, Woods electric; Gray Auto Company, Maxwell, Jackson; B. F. Adams Company, E-M-F, Flanders, Everitt; I. G. Isch & Co., Inter-State, Richmond; J. I. Case Threshing Machine Company, Case; Turnbull Garage, Moon, White; Reliance Auto Company, Hupmobile; R. F. Ford, Michigan, Cole; Warren Motor Company, Warren; Westcott Garage, Westcott; E. W. Oliver, ratchet wrench; Reliable Tire Company, supplies; F. B. Wasson, inner tubes; Fitch Auto Supplies Company, accessories; Vose Bros., Indian and Excelsior motor-



Interior of the Third Regiment Armory During the First or Pleasure Car Week of Philadelphia Automobile Show.

polishes; Jas. L. Gibney & Bro., Gibney tires, etc.; Chas. W. Gerhart, motorcycles; Keystone Lubricating Company, oils and greases; Motor Specialties Company, full line: Monitor Manufacturing Company, gasoline outfits; Puritan Soap Company, soaps and polishes; C. V. Stahl Motor Company, motors; Walter A. Schott, American self-starters and gasoline outfits.

PEORIA CITIZENS INSPECT 1912 MODELS.

Despite the exceedingly cold weather, the attendance at the show of the Peoria Auto Dealers' Association, in the Coliseum at Peoria, Ill., Jan. 10-17, was even greater than anticipated. Many sales were recorded and the local dealers are well satisfied with results.

The interior of the building was completely transformed by the decorative scheme, in which hundreds of electric lights were utilized with good effect. The

cycles; G. F. Court, Harley-Davidson motorcycles; National Refining Company, oils; Bert Partridge, marine engines; Wayne Oil Tank & Pump Company, storage systems.

DETROIT EXHIBITORS FILL TWO BUILDINGS.

Fifty thousand square feet of floor space was provided for the fifth annual show of the Detroit Automobile Dealers' Association in Wayne Gardens and Annex in Detroit, Mich., Jan. 20-27, under the management of W. R. Wilmot. In order to accommodate all who wished to make display permission was obtained from the city authorities to erect a temporary structure across the street, and both were filled to overflowing when the exhibition opened. Liberal use of mural paintings and greenery transformed the interior of both buildings, and the decorative scheme





Glidden Trophy Occupied Prominent Place in Maxwell Display During
Wayne Gardens Exhibit in Detroit,

was still further enhanced by thousands of electric lights, grouped in an artistic manner.

The show is in full keeping with the importance of the city as an automobile centre, and may be regarded of national moment. A few cars were on display, which were not seen at New York and will not be shown at Chicago. This applies particularly to the commercial vehicle division, where the only steam truck in the American market was of decided interest. Among the exhibitors were the following:

Pleasure cars—Abbott-Detroit Company, Abbott-Detroit; Ford Motor Car Company, Ford; United Motor Detroit Company, Maxwell, Columbia; J. H. Brady Auto Company, Hudson; J. P. Schneider, Stevens-Duryea; Colonial Electric Car Company, Colonial electric; Lion Motor Sales Company, Lion, Peerless; Buick Motor Car Company, Buick; Olds Motor Company, Oldsmobile; Thompson Auto Company, King; Brush Detroit Motor Company, Brush; Grant Bros, Auto Company, Everitt; Hupmobile Sales Company, Hupmobile; Lozier Motor Car Company, Lozier; Cartercar Company, Cartercar; W. H. Weber, Rambler; Foster Motor Sales Company, Cutting, Thomas; Michigan Buggy Company, Michigan; Mitchell Detroit Sales Company, Mitchell; Cunningham Auto Company, E-M-F, Flanders; Henderson Motor Sales Company, Cole: Overland Motor Sales Company, Overland; Herreshoff Motor Car Company, Herreshoff; KisselKar Company, Kissel-Kar; Oakland Motor Sales Company, Oakland; Chalmers

Motor Car Company, Chalmers; Hupp Corporation, R. C. H., Hupp-Yeats electric; W. A. Paterson Company, Paterson; M. A. Young, Reo, Elmore; Krit Motor Car Company, K-R-I-T; Seidler Sales Company, Jackson; Neumann-Lane Company, Pierce-Arrow, Stoddard-Dayton, Rauch & Lang electric; Regal Motor Car Co.. Regal; Warren Motor Co., Warren; Anderson Electric Car Company, Detroit electric; Briggs Detoiter Company, Detroiter; Marquette Car Company, Marquette; Grinnell Electric Company, Grinnell electric; Church-Field Motor Car Company, Church-Field electric; Winton Motor Car Company, Winton; Cadillac Motor Car Company, Cadillac.

Commercial cars—General Motors Truck Company, G. M. C. gasoline and electric; Commerce Motor Car Company, Commerce; Ford Motor Car Company, Ford: United Motor Detroit Company, Sampson: Neumann-Lane Company, Pierce-Arrow; Havers Motor Truck Company, Havers Motor Truck Company, American Steam Truck Company, American steam; Poss Motor Car Company, Poss; Grabowsky Power Wagon Company, Grabowsky; Seitz Motor Truck Company, Seitz; Durant-Dort Carriage Company, Best; Kislekar Company, KisselKar.

Accessories, etc.—Chas. E. Miller, Sewell Cushion

Accessories, etc.—Chas. E. Miller, Sewell Cushion Wheel Company, Automobile Equipment Company, Westinghouse Electric Company, Detroit Steering Wheel Company, Ignition Starter Company, Eby Auto Parts Company, Electric Products Company, S. & S. Shock Absorber Company, Cleveland Hardware Company, Flint Axle Works, Michigan Magneto Company, Punctureless Tire Company, Henderson Motorcycle Company, Murphy Power Garage, Wayne Oil Tank & Pump Company, Columbia Nut & Bolt Company,

PREPARE FOR BIG BUSINESS AT BOSTON.

New York and Chicago may have the honor of holding the only recognized national shows in the automobile industry, but when it comes to the matter of attendance and business transacted the Mechanics' building exhibition in Boston is admittedly the largest in America. For the first time in the history of the Boston shows, the event will be held in two sections this year, the first being devoted to pleasure cars, March 2-9, and the second to commercial vehicles, March 13-20. Accessories will be displayed at both. As in the past, the arrangements will be under the direct personal charge of Chester I. Campbell.

Advocate the use of lights on all vehicles using the public ways during the hours of darkness.



Splendid Setting in Which Pleasure Cars Were Shown by the Milwaukee Dealers in the Auditorium in That City.

Proven by the most exhaustive test to be the Best Type of Automobile Engine.

Adopted by the Atlas Company because of its wonderful record and remarkable success with the leading European manufacturers, the Daimler in England, the Mercedes in Germany, the Minerva in Belgium, the Panhard in France, and many others.

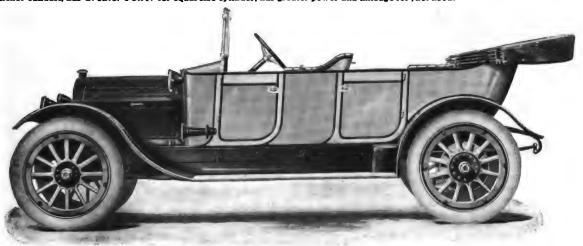
THE KNIGHT ENGINE IS THE ENGINE USED BY THE ROYALTY AND NOBILITY

Including the King and Queen of England, the Czer of Russie, the Empress of Russia, the King of Spain, the King of Belgium, the Crown Princess of Sweden, etc. More than ten thousand Knight engines now in use giving new pleasure and delight to motoring,

ADVANTAGES OF THE

OVER THE BEST TYPE OF POPPET-VALVE ENGINES

SILENCE under all running conditions; greater smoothness in running and absence of vibration; positive action of working parts; loses none of its power, silence or smooth running qualities with years of continuous service; admits Larger Charge and has freer and quicker exhaust; has Greater Power for equal size cylinder; has greater power and mileage for fuel used.



Atias-Knight Five-Passenger Touring Car.

SPECIFICATIONS

GINE—Atlas-Knight, four-cycle, four-cylinder, cast in pairs, 4½" bore, 5½" stroke. Equipped with electric seat-starter, HORSEPOWER: Fifty at twelve hundred revolu-ENGINE-

tions.

CARBURETER—New Multiple Jet Stromberg with adjustment on steering wheel.

CLUTCH—Three-plate, faced with raybestos.

TRANSMISSION—The transmission case is part of the rear axle housing. Three speed selective.

REAR AXLE—Full-Floating flange-type; the differential gears are chrome vanadium steel.

WORM-DRIVE—The worm-drive is used to eliminate the continuous grind and noise of the bevel gear drive: it is constructed according to the latest European practice where the worm-drive is now accepted as the best.

FRONT AXLE—Timken, drop-forge, with Timken adjustable roller bearings in the wheel hubs and in the steering head.

BRAKES—Two sets double-acting internal and external, mounted on rear wheel hubs,
SPRINGS—Rear: very long, flexible, three-quarter elliptic, 2½-inches wide.

elliptic, 2½-inches wide.

WHEELBASE and TREAD—Five-passenger 130-inch.
Seven-passenger 140-inch. Tread 56 inches.

TIRES and RIMS—Demountable rims, 37"x5" tires.

STANDARD EQUIPMENT—One extra universal demountable rim, imported silk mohair top with dust cover, adjustable glass wind-shield, Stewart speedometer, trunk-rack, tire holder, coat and footrails, cocoa matting, complete tool and tire outfit, complete electric light equipment, including headlights and lights in rear tonneau and on dash.

LIST PRICE—\$350.00. five-passenger. completely

PRICE \$3500.00, five-passenger, completely equipped. \$3700.00, seven-passenger, completely LIST equipped.

F. O. B. Springfield, Guaranteed for one year.

ATLAS MOTOR CAR COMPANY

SPRINGFIELD, MASSACHUSETTS

ADVANCE SHOW PLANS IN OTHER CITIES.

New Orleans dealers have decided definitely to hold a show in the Washington Artillery building, New Orleans, La., Feb. 20-25. T. C. Campbell, who has managed similar events in that city before, will have charge of the plans. The display will be under the auspices of the Automobile Dealers & Trade Association.

The Cedar Rapids Automobile Dealers' Association, Cedar Rapids, Ia., has decided upon March 11-16 as the date for its annual exhibition in that city. The event will be held in the City Auditorium, and already enough cars have been entered to fill completely the main floor and basement. This is the third season in which local displays have been held and it is anticipated that all of the local dealers will take advantage of the opportunity to make known the merits of their cars.

The seventh annual automobile show in Portland,



State Armory, Scene of Minneapolis' Forthcoming Display.

Me., will be held in the Auditorium, Portland, Me., Feb. 19-24. As in past years the event will be under the management of F. M. Prescott, who also will have charge of the second annual Bangor show in the Motor Mart at Bangor, Me., Feb. 5-10.

The fourth annual Keene motor vehicle show will be held in Keene, N. H., Feb. 21-23, under the auspices of the Consolidated Motorcyclists as in past years. The management is under the direction of C. C. Wilber, 64 Main street, to whom all communications should be addressed.

SALEM DEALERS AHEAD OF BOSTON.

Not content with awaiting the arrival of the Boston show dates the dealers in Salem, Mass., held a display under the auspices of the Essex County Automobile Association in the North street rink early in the

month. The management was under the direction of A. L. King, and the success of the venture was such as to indicate that the event will become an annual feature in Salem. Among the exhibitors were the following:

Nelson Bros., Everitt, E-M-F, Flanders; Irving & Grant, Reo, Cole, Westcott; J. Elmer Wood, Cadillac, Buick; Renzi Garage Company, Regal; Curtis-Hawkins Company, Speedwell; H. R. Bailey, Bailey electric; J. F. Kilham, motorcycles; Goodell's Garage, accessories; R. L. Cleveland, Hupmobile, Franklin; J. M. Shock Absorber Company, J. M. shock absorbers; Salem Electric Lighting Company, electric supplies; F. N. Phelps, Baker electric; H. Plumstead & Sons, Stoddard-Dayton; Currier's Garage, Maxwell; P. E. Hussey, Hudson; E. T. Reynolds, motorcycles; King-Coughlin Company, Oakland; Crowley Chemical Company, polishes; Paul Chaput, Jackson; Columbia Top & Windshield Company, windshields,

FEDERAL AID HIGHWAY CONVENTION.

The good roads federal aid convention called by the American Automobile Association in Washington, D. C., recently placed itself on record as favoring the passage of a bill creating a national highways commission to consist of a chairman and 15 members, appointed by the President and Congress. The purpose of the commission is to be the study and investigation of the good roads problem from the viewpoint of the federal government's position, to prepare a plan for government participation, and to report its findings to the President not later than Dec. 1, 1913. The representation at the convention was extremely diversified, 38 states being represented, including 115 delegates named by governors of 23 commonwealths.

E-M-F GETS TIEDEMAN TROPHY.

During the progress of the first week's show at the Madison Square Garden the Tiedeman trophy, won by Frank Witt in an E-M-F car, made by the E-M-F Company, Detroit, during the Savannah meet of Thanksgiving week, was presented to Mr. Witt by Fred Wagner, official starter of the American Automobile Association. The cup was placed in the E-M-F space at the display. It will be remembered that the three E-M-F cars entered in this event finished with place, the first time in the history of American automobile racing that this result has been noted.

GAGE WILL SELL COLES.

The Grand Central Palace show in New York City proved too much for the determination of William M. Gage, for the past year manager of the United States Hotel at Saratoga, N. Y., to retire permanently from the automobile business. For 12 years he was engaged in the sale of Mercedes and White cars, but he announced his retirement early in 1911. During the show above mentioned William L. Colt, president of the Colt-Stratton Company, of New York City, eastern distributor for Cole cars, made by the Cole Motor Car Company, Indianapolis, Ind., offered him the position of sales manager in his company, and the offer was taken at once.

Universal lighting means the safe use of public ways at night. It need not inflict unreasonable restrictions on anyone. Why not follow Massachusetts' example?



8 - DAY GRADE





· "ROUND"







Primarily intended for use inside the bodies of large enclosed cars, and for such use its case can be given a variety of fine finishes. It also makes an attractive clock for use on dashboards. Only made in 2%-inch size.

The Justly CELEBRATED " AUTO CLOCK 8-Day, High-Grade (Trade-mark)

NOW and for YEARS the RECOGNIZED STANDARD of EFFICIENCY

Clocks built with a view to stand the jars and jolts and rough riding of Automobiles. Reputation the highest. Used by parties demanding the BEST.

AP ALL SIZES STATED ARE THE APPROXIMATE DIAMETERS OF THE DIALS.

All are 8-day High-Grade. All are in DUPLEX (patent applied for) polished cast brass cases, the most thoroughly waterproof case on the market. The "SPECIAL" clocks show dial on an angle; its inner cased clock, when removed from the outer (locked) case, is excellent for use on mantels, bureaus, etc., when touring; its outer case is screwed to dashboard by hidden screws. The "SPECIAL" clocks are in large demand from dealers for owners of finest care.

The MOTOR CLOCK has he same clock movement which for years we have supplied for the hard use on Locomotives, Steam Fire Engines, etc.; its dial is of same appearance as the Auto Clock dial, but the Auto Clock movement has a somewhat finer train.

The 34 MOTOR "OFFSET" is likely to prove a quick, ready seller. Very attractive.

Ask for our new Auto Clock Circular and Price List, dated Oct. 1, 1911, illustrating and pricing the above and three new models, C. D and E.

PRICE LIST (Per Clock)

"Round" "Offset" "Limousine \$28.50 Only made in 2%-inch size \$28.00 \$36.00 30.00 26.00 45.00 41.00

If wanted fitted with outside (patent applied for) stem-winding and stem-setting device—the best of its kind—Add \$3.00 to above Price Lists. (Such device we do not apply to the "Motor" Clocks or "Special" Auto Clocks.)

For Use on AUTOMOBILES and MOTOR BOATS You want the Best? Ask your DEALER for the "CHELSEA"

On Sale by Leading Jobbers and Dealers

CHELSEA CLOCK CO., 16 State St., Boston, Mass.

ANNUAL COLISEUM DISPLAY IN CHICAGO.

Advance Information Concerning National Show in Middle Western Metropolis Indicates Largely Increased Interest in Business Vehicles---Names of Exhibitors and Spaces They Will Occupy.

OCATED in the heart of an immense district, in which the increasing sale of motor cars, particularly those designed for business purposes, has been a matter of decided comment during the past year or more, Chicago becomes one of the chief centres of the industry. The annual Coliseum show in that city has long been a feature to be considered in measuring the rapid strides made by the automobile as a practical institution. As was the case in 1911, the 12th annual display in the Coliseum, Coliseum Annex and First Regiment Armory will continue for two



S. A. Miles, General Manager Chicago tioned by the Na-Automobile Show.

ing the latter only. With the sole exception of the one attempt to hold a show of national magnitude in the South at Atlanta, Ga., in November, 1909, the only automobile exhibitions which

weeks, that from

Jan. 27 to Feb. 3

devoted to pleasure cars and that

from Feb. 5 to

10 to commercial vehicles. Accesso-

ries will be seen

both weeks, and

motorcycles dur-

tional Association o f Automobile

have been sanc-

Manufacturers each year as national shows have been those held in New York and Chicago. For some years New York has held two displays, at or near the same time, largely because of the Selden patent litigation. Chicago never has made distinction in this regard, and because of this there has been a tendency for many makers to secure space there although they were not represented at either of the New York shows.

It follows that the annual Chicago exhibit is readily conceded to be larger in number of exhibitors. Last year there were 94 makers of pleasure cars represented. This year there will be 96, and of this number, the following products were not seen either at Madison Square Garden or Grand Central Palace: Austin, Borland, Colby, Crow, Cunningham, Davis, Glide, Halladay, KisselKar, Lexington, Michigan, Republic, Schacht, Standard, Staver, Zimmerman, and Broc, Rauch & Lang and Woods electrics.

During the second, or commercial car week, there were 57 makes shown last year. This year there will be no less than 72, and as the entry lists are not yet closed, it is possible that this number may be increased materially. Those which were not seen at Madison Square Garden or the Grand Central Palace are: Adams, Avery, Chicago, Clark, Commerce, Diamond T, Dorris, F-C-S, Four-Wheel Drive, General Motors, Harder, Harwood, KisselKar, Mais, Mercury, Monitor, National, Old Reliable, Poss, Rambler, Rassel, Service, Staver, Stegeman, Sternberg, United States, Waverley and Wilcox.

In 1911, there were something like 175 exhibitors of accessories, supplies and fittings. This year there will be over 200. These figures are based upon the reports at hand at the time of writing, and all of them may be subject to revision by the time the show opens. It always is true that many new names are added at the last moment, and it is anticipated that this will hold good this year.

As an indication of the importance attached to the motor truck display, it is of interest to note that the attendance by trades at the two truck shows in New York and Chicago in 1911 was checked by a card system and that the results obtained by actual count developed that of every 1000 persons who called at the various booths the trades were divided as follows:

Building and contracting, 77; metal manufacturing, 61; lumbering and lumber yards, 60; grocery, 60; printing and publishing, 52; machinery, 46; general merchandising, 35; municipal officials, 30; hardware, 29; clothing, 28; furniture, 28; produce and commission, 27; coal, 25; building materials, 24; iron, steel and other metals, 23; trucking and delivery, 22; textiles, trimming, etc., 21; storage warehousing, 20; expressing, 20; brewing, 18; oils, greases, etc., 16; undertaking, 15; laundry, 15; electric machinery and apparatus, 15; paints and varnish, 15; pianos, 15; railroad officials, 14; drugs and chemicals, 12; heating, plumbing and ventilating, 11; grain, hay and feed, 11; baking, 11; railroad equipment and supplies, 10; meat packing, 10; paper manufacturing, eight; woodworking, eight; rugs and carpets, seven; flowers, seven; roofing, liquors, seven: mineral waters. six: six; ice, six; hospitals, five; house furnishings, five; soap and perfume, five; telephone service, five; illuminating companies, five; wagons, carriages, etc., four; boxes and barrels, four; cigars and tobacco, four; importing and exporting, four; milk and dairying. three; milling, flour, etc., three.

This would appear to justify the large increase in number of power wagon manufacturers who have elected to be represented this year. This is rather more noticeable at Chicago than at New York, for the reason that all are housed in the same display at the latter city. It is significant, however, that in 1911, the Coliseum itself was found adequate for the needs of the exhibit, which was much in the nature of an experiment, while this year at least 30 makers will show in the First Regiment Armory, in addition to those to be seen in the Coliseum proper.

It should not be understood that little importance is attached to the pleasure car show. In every respect the 1912 display will be an advance upon previous events of this character in that centre. It is only because of the rapid growth of the commercial side of the industry that it occupies greater prominence in considering the forthcoming exhibition. It hardly will be presumed that the people of the Middle West have lost their interest in the so-called pleasure car, because they have come to realize the supreme advantage of the industrial transport.

The Coliseum at Chicago lends itself admirably to the decorator's art, and the annual Chicago show always has been noted in this respect. Last year tungsten lamps were employed for the first time, making the interior a blaze of light and reflecting the beauty of the entire scheme as never before. While

first made its appearance at a display in that city. Inasmuch as many firms are known to be working out plans of one character or another and as these were not announced during the New York exhibits, it is considered quite possible that Chicago may have the honor of revealing some other important discovery this year.

No matter what the results, it is safe to predict that the chief exhibit of the Middle West will prove of immense value in stimulating business throughout a wide area. As is well known the attendance at the 1911 show was far in excess of that at the New York exhibits, and there is no reason for presuming that this will not prove true again in 1912. The district served by this centre has become interested in all forms of motor transportation as never before, and despite the fact that many cities are to hold local shows, past successes would indicate that those who desire to make comparison of the various features will not neglect the opportunity to study all the mod-



Exterior of the Coliseum at Chicago, Scene of the 12th Annual Motor Car Exhibit of the National Association of Automobile Manufacturers in That City.

the management has not seen fit to make public its detailed plans in this regard, it is understood that the setting will be even more elaborate than before, but this does not mean that the decorations will be allowed to detract one whit from the beauty of the cars on display. Judging from the handsome coachwork seen at New York, and as it is understood most of these cars will be shown at Chicago, it may be taken for granted that this year's show will far surpass any exhibition of this character ever held. The same thing applies with equal effect to the interior of the Annex and the First Regiment Armory.

In the matter of innovations, the industry always awaits the Chicago show before feeling assured that all of the new things have been disclosed. It is remembered that the Knight sliding sleeve engine, now so important in the discussion of mechanical features

els side by side at the national automobile show in Chicago.

The annual Coliseum show in Chicago is under the direct auspices of the National Association of Automobile Manufacturers, as in other years. S. A. Miles, general manager of that organization, has complete supervision of the plans, and his experience in charge of all the national exhibitions the industry has known in that city makes him eminently well qualified for the position.

On the succeeding pages are given the names and addresses of all the exhibitors, including pleasure and commercial cars, motorcycles, accessories, parts, supplies and fittings, and the spaces they will occupy. The arrangement is in alphabetical order and the tabulation is accompanied by diagrams of the exhibition floors, making a complete guide to the show.



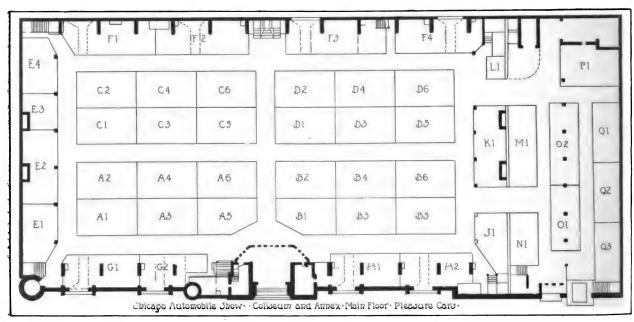
CLASSIFIED LIST OF EXHIBITORS AT CHICAGO.

PLEASURE CARS.

- C L1—
 Abbott-Detroit, Abbott Motor
 Company, Detroit, Mich.
- C M1— Alco, American Locomotive Company, Providence, R. I.
- C Q1— American, American Motors Company, Indianapolis, Ind.
- C3—
 Amplex, Simplex Motor Car Company, Mishawaka, Ind.
- G3—
 Auburn, Auburn Automobile Company, Auburn, Ind.
 - D3— Austin, Austin Automobile Company, Grand Rapids, Mich.

- C C4— Chalmers, Chalmers Motor Company, Detroit, Mich.
- ** 11—
 Colby, Colby Motor Company,
 Mason City, Ia.
- C N1—
 Cole, Cole Motor Car Company,
 Indianapolis, Ind.
- C F1— Columbia, Columbia Motor Car Company, Hartford, Conn.
- C F4—
 Corbin, Corbin Motor Vehicle
 Corporation, New Britain, Conn.
- ** 3— Crow, Crow Motor Car Company, Elkhart, Ind.
- E4—
 Cunningham, James Cunningham,
 Son & Co., Rochester, N. Y.

- * A3—
 Firestone Columbus, Columbus
 Buggy Company, Columbus, O.
- C H1— Flanders, Flanders Manufacturing Company, Pontiac, Mich.
- C A3— Franklin, H. H. Franklin Manufacturing Co., Syracuse, N. Y.
- C1—
 Garford, Garford Company, Elyria, O.
- C.Q3—
 Glide, Bartholomew Company,
 Peoria, Ill.
- E5—
 Great Western, Great Western
 Automobile Company, Peru, Ind.
- Halladay, Streator Motor Car



- C 02— Baker, Baker Motor Vehicl Company, Cleveland, O.
- ** 7— Bergdoll, L. J. Bergdoll Motor Company, Philadelphia, Penn.
- ** 4—
 Borland Borland-Grannis Company, Chicago, Ill.
- •• 5— Broc, Broc Electric Vehicle Company, Cleveland, O.
- C E1—
 Brush, Brush Runabout Company,
 Detroit, Mich.
- C A4—
 Buick, Buick Motor Company,
 Flint, Mich.
- Cadillac, Cadillac Motor Car Company, Detroit, Mich.
- C4—
 Cartercar, Cartercar Company,
 Pontiac, Mich.

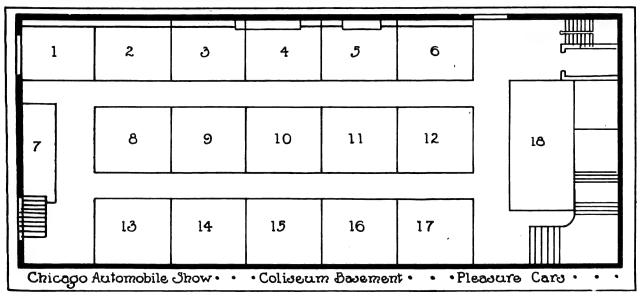
- * F1-Cutting, Clarke-Carter Automobile Company, Jackson, Mich.
- ** 17—
 Davis, G. W. Davis Carriage Company, Richmond, Ind.
- D4—
 De Tamble, De Tamble Motors
 Company, Anderson, Ind.
- C2—
 Detroit Electric, Anderson Electric Car Company, Detroit, Mich.
- C 01— Elmore, Elmore Manufacturing Company, Clyde, O.
- C A6— E-M-F, Flanders, E-M-F Company, Detroit, Mich.
- C G1— Everitt, Metzger Motor Car Company, Detroit, Mich.
- E6—
 Fiat, Fiat Automobile Company, New York, N. Y.

- Company, Streator, Ill.
- C F3— Haynes, Haynes Automobile Company, Kokomo, Ind.
- C B4Hudson, Hudson Motor Car Company, Detroit, Mich.
- C G2 Hupmobile, Hupp Motor Car Company, Detroit, Mich.
- F2—
 Imperial, Imperial Automobile
 Company, Jackson, Mich.
- A4—
 Inter-State, Inter-State Automobile Company, Muncie, Ind.
- D1— Jackson, Jackson Automobile Company, Jackson, Mich.
- ** 16-King, King Motor Car Company. Detroit, Mich.
- * E1— KisselKar, Kissell Motor Car Company, Hartford, Wis.

- C E4
- Knox, Knox Automobile Company, Springfield, Mass.
- F.3.
- K-R-I-T, K-R-I-T Motor Car Company, Detroit, Mich.
- Lexington, Lexington Motor Car Company, Lexington, Ky.
- Lion, Lion Motor Car Company, Adrian, Mich.
- C B2-Locomobile, Locomobile Company of America, Bridgeport, Conn.
- C B3-
 - Lozier, Lozier Motor Company, Detroit, Mich.
- C A5 Marmon, Nordyke & Ma Company, Indianapolis, Ind. Marmon
- Marquette, Marquette Motor Car Company, Saginaw, Mich

- Oakland, Oakland Mo Company, Pontiac, Mich. Motor
- C PL Ohio Electric, Ohio Electric Car Company, Toledo, O.
- 13-Ohio, Ohio Motor Car Company, Cincinnati, O.
- Oldsmobile, Olds Motor Works, Lansing, Mich.
- C D5-Overland, Willys-Overland Company, Toledo, O.
- C C1-Packard, Packard Mc Company, Detroit, Mich. Packard Motor Car
- Paterson, W. A. Paterson Company, Flint, Mich.
- C D6-Peerless Peerless Motor Car Company, Cleveland, O.

- D2-Regal, Regal Motor Car Company, Detroit, Mich.
- C B5-Reo. Reo Motor Car Company, Lansing, Mich.
- 13. Republic, Republic Motor Car Company, Hamilton, O.
- 18 Schacht, Schacht Motor Car Company, Cincinnati, O.
- C Q2-Selden, Selden Motor Car Company, Rochester, N. Y.
- ** 14_ Standard, Standard Electric Company, Jackson, Mich.
- E2_ Staver, Staver Carriage Company, Chicago, Ill.
- C H2-Stearns, F. B. Stearns Company, Cleveland, O.



- C J1
 - Matheson, Matheson Automobile Company, Wilkesbarre, Penn.
- C D1-Maxwell, Maxwell-Briscoe Motor Company, Tarrytown, N. Y.
- G5 McFarlan, McFarlan Motor Car Company, Connersville, Ind.
- McIntyre, W. H. McIntyre Company, Auburn, Ind.
- Michigan, Michigan Buggy Com-
- pany, Kalamazoo, Mich. C K1-
- Mitchell, Mitchell-Lewis Motor Company, Racine, Wis.
- Moline, Moline Automobile Company, East Moline, Ill.
- C Ge-Moon, Moon Motor Car Company, St. Louis, Mo.
- C CK National, National Motor Vehicle Company, Indianapolis, Ind.

- * B4
- Pierce, Pierce Motor Company, Racine, Wis.
- C C2

Pierce-Arrow, Pierce-Arrow Motor Car Company, Buffalo, N. Y.

Pope-Hartford, Pope Manufacturing Company, Hartford, Conn.

C D3-

Premier, Premier Motor Manufacturing Company, Indianapolis, Ind.

C E3-

Pullman, Pullman I Company, York, Penn. Pullman Motor Car

C A2-

Rambler, Thomas B. Jeffery Company, Kenosha, Wis.

Rauch & Lang, Rauch & Lang Carriage Company, Cleveland, O.

A1-

R. C. H., Hupp-Yeats, Hupp Corporation, Detroit, Mich.

C C3-

Stevens-Duryea, Stevens-Duryea Company, Chicopee Falls, Mass.

C D2-

Stoddard-Dayton, Dayton Motor Car Company, Dayton, O.

- Stutz, Ideal Motor Car Company, Indianapolis, Ind. C E2
- Thomas, E. R. Thomas Motor Company, Buffalo, N. Y.
- G1 -Warren-Detroit, Warren Motor Car Company, Detroit, Mich.
- Waverley, Waverley Company, Indianapolis, Ind.
- Westcott, Westcott Mot Company, Richmond, Ind. Westcott Motor Car
- C F2 White, White Company, Cleveland, O.
- C A1-Winton, Winton Motor Carriage Company, Cleveland, O.

- C B1—
 - Woods, Woods Motor Vehicle Company, Chicago, Ill.
- ** 8— Zimmerman, Zimmerman Manufacturing Company, Anderson, Ind.
- C, Coliseum; * First Regiment Armory; ** First Regiment Armory Basement.

POWER WAGONS.

- C N3—
 Adams, Adams Bros.' Company, Findlay, O.
- C E1— Alco, American Locomotive Company, Providence, R. I.

- * 5-6— Chase, Chase Motor Truck Company, Syracuse, N. Y.
- * B3— Chicago, Chicago Commercial Car Company, Chicago, Ill.
- M2—

Clark, Clark Delivery Wagon Company, Chicago, Ill.

- A1-3-Commer, Wyckoff, Church & Par-
- Commer, Wyckoff, Church & Partridge, New York, N. Y.
- Commerce, Commerce Motor Car Company, Detroit, Mich.
- C Q2—
 Dayton, Dayton Auto Truck Company, Dayton, O.
- F 2 F 1 Ш **G6 E6** C3 C4 D3 **D4 G.5** E5 Cl C2 Dl D2 G4 E4 G3 E3 A 4 A3 **B**3 **B4** G2 E2 Βl **B2** Αl A2 El G١ (V/V) Al Chicago Automobile Show. First Regiment Armory. ·Mainfloor · Pleasure Cars ·
- C P2— Atterbury, Atterbury Motor Car Company, Buffalo, N. Y.
- C C2—
 Avery, Avery Company, Peoria, Ill.
- Baker, Baker Motor Vehicle Company, Cleveland, O.
- C D4— Brush, Brush Runabout Company, Detroit, Mich.
- * C4—
 Buick, Buick Motor Company,
 Flint, Mich.
- C C5— Cartercar, Cartercar Company, Pontiac, Mich.

C E2—

Detroit Electric, Anderson Electric Car Company, Detroit, Mich.

Diamond T, Diamond T Motor Car Company, Chicago, Ill.

C Q4— Dorris, Dorris Motor Car Company, St. Louis, Mo.

C Q1...
Durant-Dort, Durant-Dort Carriage Company, Flint, Mich.

C E3— F-C-S, Schmidt Bros.' Company, Chicago, Ill.

C N2—
Federal, Federal Motor Truck
Company, Detroit, Mich.

- B1—
 Four-Wheel Drive, Four-Wheel
 Drive Auto Company, Janesville,
 Wig
- C D1-Garford, Garford Company. Elyria, O.
- C H.—
 General Motors, General Motors
 Company, Detroit, Mich.
- C S—
 General Vehicle, General Vehicle Company, Long Island City, N. Y.
- C B4— Grabowsky, Grabowsky Power Wagon Company, Detroit, Mich.
- C D6—
 Gramm, Gramm Motor Truck
 Company, Lima, O.
- C 0— Harder, Harder Motor Truck Company, Chicago, Ill.
- D3— Harwood, Harwood-Barley Manufacturing Company, Marion, Ind.
- C D3—
 Hewitt, Metzger Motor Car
 Company, Detroit, Mich.
- CB3-Kelly, Kelly Motor Truck Company, Springfield, O.
- C F1— KisselKar, Kissel Motor Car Company, Hartford, Wis.
- C D5— Knox, Knox Automobile Company, Springfield, Mass.
- Lauth-Juergens, Lauth-Juergens Motor Car Company, Fremont, O. C C4-
- Locomobile, Locomobile Company of America, Bridgeport, Conn.
 C K____
- Lozier, Lozier Motor Company, Detroit, Mich. C A4— Mack, Mack Bros. Motor Car
- Company, Allentown, Penn.

 R—

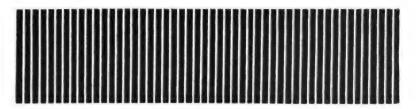
 Mais, Mais Motor Truck Company, Indianapolis, Ind
- pany, Indianapolis, Ind.

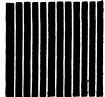
 C L—

 McIntyre, W. H McIntyre Company, Auburn, Ind.
- D4—
 Mercury, Mercury Manufacturing

 Company, Chicago, Ill.
- G3—
 Monitor, Monitor Auto Works,
 Janes'ville, Wis.
- Janesville, Wis.
 C M1
 - Morgan, Morgan Motor Truck Company, Worcester, Mass.
- Motor Wagon, Motor Wagon Company, Detroit, Mich.
- National, National Motor Truck Company, Bay City, Mich.
- Old Reliable, Harry Lee Power Company, Chicago, Ill.
- C C1—
 Packard, Packard Motor Car
 Company, Detroit, Mich.
- * B5— Packers, Packers Motor Truck Company, Wheeling, W. Va.







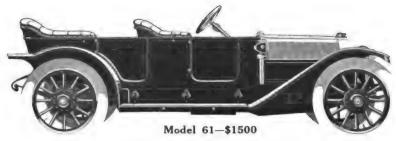


A LL of the standard popular priced cars are represented in this issue. This gives you a splendid opportunity to make a few comparisons of motor car values and to verify our claims, that in an Overland car you get more real car for less money than in any other machine on the market.

The example—take our Model 6l. This car has a big 45 horsepower motor. Is a five-passenger touring car. The wheel base is one hundred and fifteen inches. The axles are fitted with the finest Timken bearings. The transmission is fitted with F & S annular bearings. The pressed steel frame has a double drop. The handsome body is finished in rich Brewster green trimmed with heavy nickel plate. The lamps are dead black and nickel plated. The magneto is a Bosch. This car is priced at \$1500. Have you ever seen its equal for less than \$2000?

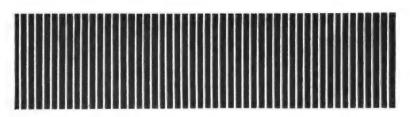
¶ Our interesting factory book explains why the greatest organization in the business can make these fine cars to sell at such remarkably low prices. Write for a copy. Please ask for copy K41.

The Willys-Overland Company, Toledo, Ohio.



Wheel base, 115 inches; body, 5-passenger fore-door touring; motor 4 3-8 x 4 1-2; horsepower, 45. Bosch magneto; tires, 34x4 inch, Q. D.







THE AUTOMOBILE JOURNAL.

C D2-

Peerless, Peerless Motor Car Company, Cleveland, O.

C F2— Pierce-Arrow, Pierce-Arrow Motor Car Company, Buffalo, N. Y.

Pope-Hartford, Pope Manufacturing Company, Hartford, Conn.

E3—
 Poss, Poss Motors Company, Detroit, Mich.

C A1— Rambler, Thomas B. Jeffery Company, Kenosha, Wis.

C B1—
Rapid, General Motors Truck
Company, Detroit, Mich.

C N1—
Rassel, Rassel Motor Car Company, Toledo, O.

C G— Reliance, General Motors Truck Company, Detroit, Mich. C C3—
Stearns, F. B. Stearns Company,
Cleveland, O.

* A4... Stegeman, Stegeman Motor Car Company, Milwaukee, Wis.

* C1— Sternberg, Sternberg Manufacturing Company, Milwaukee, Wis.

C Q2— United States, United States Motor Truck Company, Cincinnati, O.

Universal, Universal Motor Truck Company, Detroit, Mich.

Velie, Velie Motor Vehicle Company, Moline, Ill.

 * A2— Walker, Walker Vehicle Company, Chicago, Ill.

C C6—
Waverley, Waverley Company,
Indianapolis, Ind.

CA 114—
Henderson, Henderson Motorcycle Company, Detroit, Mich.

CA 136-9...
Indian, Hendee Manufacturing
Company, Springfield, Mass.

CA 153-5— Merkel, Miami Cycle & Manufacturing Company, Middletown, O. CA 79—

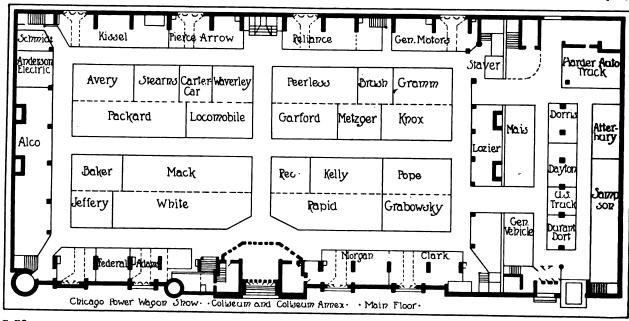
Minneapolis, Minneapolis Motor Cycle Company, Minneapolis, Minn.

CA 142-4— New Era, New Era Auto Cycle Company, Dayton, O.

CA 151-2—
Pierce, Pierce Cycle Company,
Buffalo, N. Y.

CA 145-6—
Pope, Pope Manufacturing Company, Hartford, Conn.

CA 133-5— R-S, Reading Standard Company,



C B2-Reo. Reo Motor Car Company, Lansing, Mich.

C P1...
Sampson, Alden Sampson Manufacturing Company, Detroit, Mich.

* B2___ Sanbert, Sanford-Herbert Company, Syracuse, N. Y.

Schacht, Schacht Motor Car Company, Cincinnati, O.

G2—
Service, Service Motor Car Company, Wabash, Ind.

B6—
 Smith, A. O. Smith Company, Milwaukee, Wis.
 E1—
 E1—

Speedwell, Speedwell Motor Car Company, Dayton, O.

C J—
Staver, Staver Carriage Company,
Chicago, Ill.

C **A3—** White, White

White, White Company, Cleveland, O.

Wilcox, H. E. Wilcox Motor Car Company, Minneapolis, Minn.

C, Collseum; * First Regiment Armory.

MOTORCYCLES—FIRST WEEK.

CA 147-50— Emblem, Emblem Manufacturing Company, Angola, N. Y.

CA 131-2— Excelsior, Excelsior Supply Company, Chicago, Ill.

CA 81-2— Flanders, Flanders Manufacturing Company, Pontiac, Mich.

CA 124-6— Harley-Davidson, Harley-Davidson Motor Company, Milwaukee, Wis. Reading, Penn.

CA 94-5-

Thor, Aurora Automatic Machinery Company, Aurora, Ill

CA 130— Wagner, Wagner Motorcycle Company, St. Paul, Minn.

CA 127-9-Yale, Consolidated Manufacturing Company, Toledo, O.

ACCESSORY EXHIBITORS.

Tires,

CG 26-27—
Ajax-Grieb Rubber Company,
New York, N. Y. Ajax tires and
tubes,

CA 126*—

Batavia Rubber Company, 1
tavia, N. Y. Batavia tires a
tubes.

CG 34-35— Consolida

Consolidated Rubber Tire Company, New York, N. Y. Kelly-Springfield tires and tubes.



CA 139*-

Continental Rubber Works Company, Erie, Penn.

CG 18

Diamond Rubber Company, Ak-ron, O. Diamond tires and tubes.

CA 109-

Empire Tire Company, Trenton, N. J. Empire shoes and tubes.

CA 107-

Federal Rubber Manufacturing Company, Cudahy, Wis. Federal tires and tubes.

CG 67-68-

Firestone Tire & Rubber Com-pany, Akron, O. Firestone tires, tubes and rims.

CG 38-39-

Fisk Rubber Company, Chicopee Falls, Mass. Fisk tires, tubes and rims.

CG 47-48-

B. F. Goodrich Company, Akron, O. Goodrich tires and tubes.

CG 51-52-

Goodyear Tire & Rubber Com-pany, Akron, O. Goodyear tubes, tires and rims.

CA 101-

J. Ellwood Lee Company, Con-shohocken, Penn. Jelco tires and

CG 8-9-

Michelin Tire Company, Milltown, N. J. Michelin tires, tubes and rims.

CG 2-3-

Motz Clincher Tire & Rubber Company, Akron, O. Motz tires,

CG 12-13-

Pennsylvania Rubber Company, Jeannette, Penn. Pennsylvania tires and tubes.

FR 10**-

Punctureless Tire Company of Illinois, Chicago, Ill. Punctureless tires.

CG 30-31.

Republic Rubber Company, Youngstown, O. Republic tires and tubes.

FR 39*-

Shawmut Tire Company, Boston, Mass. Shawmut tires and tubes.

CA 154*-

Stein Double Cushion Tire Company, Akron, O. Stein double cushion tires.

CG 15

Swinehart Tire & Rubber Company, Akron, O. Swinehart tires and tubes

CG 43-44-45-

United States Tire Company, New York, N. Y. Hartford, Con-tinental, G & J and Morgan & Wright tires and tubes.

Lubricants.

CA 135+_

Columbia Lubricants Company of New York, New York, N. Y. Monogram oils and greases.

CA 132°-

Adam Cook's Sons, New York, N. Y. Albany greases.

CA 180°-

Joseph Dixon Crucible Company, Jersey City, N. J. Graphited greases, graphite compounds.

CG 58-A. W. Harris Oil Company, Providence, R. I. Harris oils and

CA 91-

Havoline Oil Company, New York, N. Y. Havoline oils and greases.

CA 114-

George A. Haws, New York, N. Y. Panhard oils and greases.

CA 119-

International Acheson Graphite Company, Niagara Falls, N. Y. Graphited oils, greases and compounds.

FR 29*-

Keystone Lubricating Company, Philadelphia, Penn. Keystone oils and greases.

CA 92-

Ignition Champion Company. Champion mag-Flint, Mich. netos, spark plugs, etc.

CG 16-

Connecticut Telephone & Electric Company, Meriden, Conn. Con-necticut magnetos and electric specialties.

CA 83-

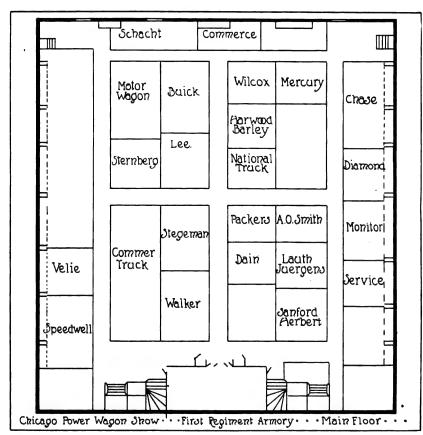
Eisemann Magneto Company, New York, N. Y. Eisemann magnetos.

CA 115-

General Electric Company, Sche-Magnetos and nectady, N. Y. Pelectric specialties.

CA 95*-

Heinze Electric Company, Low-



CG 20-

New York & New Jersey Lubricants Company, New York, N. Y. Motorol oils and Non-Fluid greases.

CA 148*-

Wolverine Lubricants Company, New York, N. Y. Packard oils and greases.

Magnetos.

CA 87-

American Circular Loom Company, Aldeno, N. J. No-Lag magnetos.

CA 99....

Bosch Magneto Company, New York, N. Y. Bosch magnetos and ignition specialties.

ell, Mass. Heinze magnetos and ignition specialties.

CG 53-

Herz & Co., New York, N. Y. Herz magnetos, spark plugs, ignition specialties.

CA 116-

Jacobson - Brandow Company, Pittsfield, Mass. J-B magnetos and ignition specialties.

FR 3-4**-

Marburg Brothers, N N. Y. Mea magnetos. New York.

FR 24**-

Michigan Magneto Company, Detroit, Mich. Michigan magnetos.

CA 104-

National Coil Company, Lansing, Mich. Magnetos, coils and ignition apparatus.



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CG 64

Pittsfield Spark Coil Company, Dalton, Mass. Pittsfield magnetos, spark plugs, ignition specialties.

CG 14.

Remy Electric Company, Anderson, Ind. Remy magnetos and electric specialties.

CA 122_

Simms Magneto Company, New York, N. Y. Simms magnetos.

CG 49-

C. F. Splitdorf, New York, N. Y. Splitdorf magnetos, spark plugs and ignition specialties.

Windshields.

FR 9*-

Eagle Company, Newark, N. J Eagle windshields.

CA 138*-

Sprague Umbrella Company, Norwalk, O. Sprague windshields.

FR 37*_

Troy Carriage Sun Shade Com-

odometers, live map meters.

CA 108-

Stewart & Clark Manufacturing Company, Chicago, Ill. Stewart speedometers.

CG 42

Veeder Manufacturing Company, Hartford, Conn. Hub odometers, cyclometers, tachodometers, counters, die castings.

CA 124*_

Warner Instrument Company. Beloit, Wis. Warner auto-meters, speed registers, etc.

Ignition Devices.

CG 6-Atwater Kent Manufacturing Works, Philadelphia, Penn. Unisparkers, ignition specialties, etc. CA 113*_

Briggs & Stratton Company, Milwaukee, Wis. Timers, switches, etc.

CG 16—
Connecticut Telephone & Electric Company, Meriden, Conn. Elecpany, Cleveland, O. Booth demountable rims.

CA 117*-

Dorian Remountable Rim Company, New York, N. Y. Dorian remountable rims.

Lamps, Headlights.

CA +128. American Brass Foundry Company, Milwaukee, Wis. Electro-

bola head lamps

CG 41-Badger Brass Manufacturing Company, Kenosha, Wis. Solar head, dash and tail lamps.

CG 73-

Edmunds & Jones Manufacturing Company, Detroit, Mich. E & J head, dash and tail lamps.

CG 46-

Gray & Davis, Amesbury, Mass. Gray & Davis automobile lamps, lighting systems.

CG 4*-

C. T. Ham Manufacturing Com-

90 89 88 87 86 84 83 82 91 85 92 108 107 106 105 104 103 102 101 100 99 98 97 77 93 121 120 119 118 117 116 115 114 113 112 110 111 109 78 94 79 139 138 137 136|135 134 133 132 131 130 95 129 128 127 126 125|124 80 142 141 96 140 152 151 150 149 148 147 146 145 144 143 81 Chicago Automobile Show. ·Coliseum Annex · · Second Floor · Accessories ·

pany, Troy, O. Troy windshields. CA 147*-

Universal Windshield Company, Chicago, Ill. Universal windshields.

Shock Absorbers.

FR 14-15**-

Aristos Company, New York, N. Y. Mondex shock absorbers.

CG 59-60-

Hartford Suspension Company. Jersey City, N. J. Hartford shock absorbers and auto jacks.

CA 129*-

J. H. Sager Company, Rochester. N. Y. Sager equalizing springs, etc.

Speedometers.

CA 133*. Hoffecker Hoffecker Company, Bosto Mass. Hoffecker speedometers. Boston.

CG 21_

Jones Speedometer Company, New York, N. Y. Jones speedometers, recorders, gasoline gauges, hub trical and ignition devices.

CG 53-

Herz & Co., New York, N. Y. Ignition specialties.

CG 74-

Kokomo Electric Company, Kokomo, Ind. Kingston coils, spark plugs, etc.

FR 25*-

K-W Ignition Company, Cleveland, O. K-W system of ignition.

W. H. Leland & Co., Worcester, Mass. Worcester spark colls, Mass. switches.

Pittsfield Spark Coil Company, Dalton, Mass. Timers, switches, coils, etc.

CG 49-C. F. Splitdorf, New York, N. Y. Coils, switches, etc.

Demountable Rims. CA 96 --

Booth Demountable Rim Com-

pany, Rochester, N. Y. Ham "Cold Blast" dash and tail lamps.

CG 7-

Imperial Brass Manufacturing Company, Chicago, Ill. Pumps, metal fittings, hardware.

Exhaust Horns.

FR 4+_ Barco Brass & Joint Company, Chicago, Ill. Barco exhaust horns, cut-outs.

CA 79*-

Gabriel Horn Manufacturing Company, Cleveland, O. Gabriel horns, shock absorbers.

CA 127*

Gray-Hawley Manufacturing Company, Detroit, Mich. Auto-chimes, cut-outs, pedal valves, etc.

Electric Horns.

CA 142*-

Automobile Supply Manufacturing Company, Brooklyn, N. Y. Newtone horns

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THE EAGLE

Clear Vision, Rain Vision, Wind Shield

Designed
and Built
by Experts



Strong Rigid Silent

Easy to operate, as it is equipped with that wonderful STANDARD FRICTION HINGE

Easily placed in any position and will stay where put.

SPECIFICATIONS:

		ALL GLA	OO 74" FLAIL	PRICE
WIDTH	HEIGHT	TOP	LOWER	BRASS
41 "	27 😼 🖷	12"	1 4 "	\$50.00
41"	31 W	14"	16 "	50.00
44"	27 "	12"	1 4 "	55.00
44"	31 "	14"	16 "	55.00

Special Finish: White or Black Nickel and Gun Metal, \$5.00 extra.

We also carry in stock a complete line of Standard Friction Wind Shields, from \$22.50 each to \$40.00 each. Send for descriptive circular.

Sole New England Distributors:

BI-MOTOR EQUIPMENT CO.

177-179 Portland Street, Boston, Mass. R. E. Hardy Company, Chicago, Ill. Sta-Rite, Venus and Vulcan

Herz & Co., New York, N. Y. Herz

CG 6-Kent Manufacturing Atwater Works, Philadelphia, Penn. Monoplex horns.

CA 78-Dean Electric Company, Elyria, O. Tuto electric horns.

CA 97-Lovell-McConnell Manufacturing Company, Newark, N. J. Klaxon and Klaxonette horns.

Storage Batteries.

FR 39**-Dayton Engineering Laborato-

ries Company, Dayton, O. Delco ignition system.

CA 106-

Edison Storage Battery Company, West Orange, N. J. Edison vehicle and ignition batteries.

GC 69h-Electric Storage Battery Com-pany, Philadelphia, Penn. Exide vehicle and ignition batteries.

CG 37-A. R. Mosler & Co., New York, N. Y. Spitfire, Triumph and Broochblock spark plugs.

CG 64-

CG 25-

CG 53-

spark plugs,

spark plugs, etc.

Pittsfield Spark Coil Company, Dalton, Mass. Jewell spark plugs.

C. F. Splitdorf, New York, N. Y. Splitdorf spark plugs, etc.

Electric Lighting Systems.

CA 98-

Apple Electric Company, Dayton, O. Dynamos, ignition and electric lighting systems.

FR 21b*-

Martel Blow-Out Protector Company, Chicago, Ill. Martel blowout protector.

CA 141*-

Universal Tire Protector Company, Angola, Ind. Universal treads.

Axles.

CG 29-

American Ball Bearing Company. Cleveland, O. Rear axles.

FR 22-

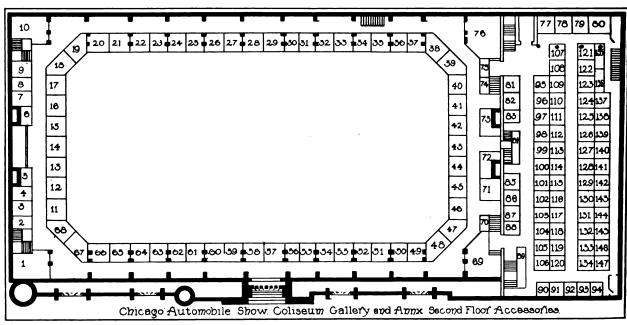
Sheldon Axle Company, Wilkesbarre. Penn. Front and rear axles, jackshafts, etc.

CA 111-

Stutz Auto Parts Company, Indianapolis, Ind. Stutz axles. Stutz axles. transmissions, etc.

CG 32

Timken-Detroit Axle Company, Detroit, Mich. Timken axles, etc. FR 12**-



CG 76a

United States Lighting and Heating Company, New York, N. Y. National lighting and ignition batteries.

CG 56-

Vesta Accumulator Company, Chicago, Ill. Vesta accumulators.

CA 150*-

Willard Storage Battery Company, Cleveland, O. Lighting and ignition batteries.

Dry Battery Cells.

CG 40-National Carbon Company, Cleveland, O. Columbia dry cells.

Spark Plugs, Etc.

CA 99-Bosch Magneto Company, New York, N. Y. Bosch spark plugs, etc.

Ignition Company, Champion Flint, Mich. Champion spark plugs, etc. CA 93-

Detroit Electric Appliance Company, Detroit, Mich. Deaco dynamos and equipment.

CG 46-

Gray & Davis, Amesbury, Mass. Gray & Davis lighting system.

CA 150*-Willard Storage Battery Company, Cleveland, O. Elba lighting system.

Tire Tubes.

CA 81*-Voorhees Rubber Manufacturing Jersey City, N. Company, Tubes and repairing material.

Tire Protectors.

Double Fabric Tire Company, Auburn, Ind. Interlock inner tires, etc.

CA 86-

CA 143*-

Leather Tire Goods Company, Niagara Falls, N. Y. Woodworth treads, tire sleeves, etc.

Torbenson Gear & Axle Company. Bloomfield, N. J.

CG 11-Warner Gear Company, Muncie, Ind. Warner transmissions, axles, etc.

CA 102-

Warner Manufacturing Company, Toledo, O. Axles, transmissions, gears, etc.

CG 66-

Westen-Mott Flint Company, Mich. Axles, rims, hubs, etc.

Ball Bearings.

FR 13— Rhineland Machine Works Company, New York, N. Y. Rhineland ball bearings.

CG Kh Standard Roller Bearing Company, Philadelphia, Penn. Thrust ball bearings.

FR 7-

U. S. Ball Bearing Manufacturing Oak Park, Ill. Ball Company, bearings.

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Metal Specialties.

CA 103—
Turner Brass Works, Sycamore,
Ill. Automobile fittings and
hardware,

Drop Forgings,

CG 10— Driggs-Seabury Ordnance Corporation, Sharon, Penn. Drop forged and pressed steel products.

CA 152*— Western Tool & Forge Company, Breckenridge, Penn. Drop forgings.

CG 57— J. H. Williams Company, Brooklyn, N. Y. Drop forgings.

Steels and Metals.

FR 21**—
American Bronze Company, Berwyn, Penn. Non-Gran bronze products.

Steel and Iron Castings.

FR 33**—
Chicago Steel Foundry Company,
Chicago, Ill. Steel castings.

CA 77— Isaac G. Johnson & Co., New York, N. Y. Steel and malleable iron castings.

Steering Gears.

Auto Parts Manufacturing Company, Muncie, Ind. Clutches, steering transmission gears, universal joints.

CA 90—
Gemmer Manufacturing Company, Detroit, Mich. Steering gears.

gears.

FR 25-26**—
Lavigne Manufacturing Company. Detroit, Mich. Steering gears, oilers, metal parts.

CA 105....
Ross Gear & Tool Company, Lafayette, Ind. Steering gears.

Wheel Rims.

CG 28— Standard Welding Company, Cleveland, O. Wheel rims,

CA 112— United Rim Company, Akron, O. Wheel rims.

Wood and Metal Products.

CA 144*—
Hess Spring & Axle Company,
Carthage, O. Springs, axles.

National Tube Company, Pittsburg, Penn. Shelby seamless steel tubes.

CA 80°— A. O. Smith Company, Milwaukee, Wis. Pressed steel frames, parts, etc.

CG 63— Spicer Manufacturing Company, Plainfield, N. J. Universal joints.

Transmissions, Etc.

CA 82—
Auto Parts Manufacturing Company, Muncie, Ind. Friction
clutches, steering and transmission gears,

CG 65— Brown-Lipe Gear Company, Syracuse, N. Y. Gears, transmissions, axles, etc.

CA 88—
Covert Motor Vehicle Company,
Lockport, N. Y. Covert transmissions.

FR 8— Lefever Arms Company, Syracuse, N. Y. Lefever transmissions, jackshafts, etc.

CA 155°— McCue Company, Buffalo, N. Y. Axles, transmissions, etc.

FR 9...

Merchant & Evans Company,
Philadelphia, Penn. Transmissions, jackshafts, clutches, etc.

CA 86— Muncie Gear Works, Muncie, Ind. Transmissions, jackshafts, brake pany, Chicago, Ill. Stromberg carburetors.

CG 17— Wheeler & Schebler, Indianapolis, Ind. Schebler carburetors.

Chains-Driving.

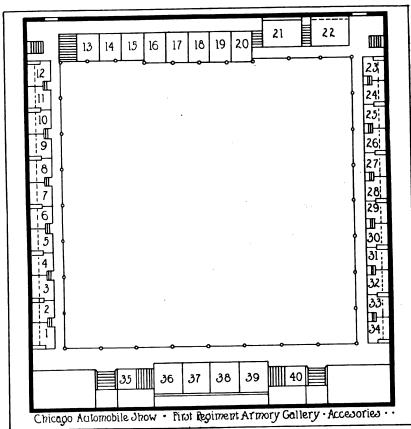
CG 61— Baldwin Chain & Manufacturing Company, Worcester, Mass. Baldwin chains, sprockets.

CG 54-

Diamond Chain & Manufacturing Company, Indianapolis, Ind. Diamond chains, chain cases.

FR 18_

S. Hoffnung & Co., Ltd., New York, N. Y. Coventry chains.



drums, differentials.

CG 11— Warner Gear Company, Muncie, Ind. Transmissions, differentials, steering gears.

CA 102— Warner Manufacturing Company, Toledo, O. Transmissions, differentials, steering gears.

Carburetors.

CG 75— Byrne, Kingston & Co., Kokomo, Ind. Kingston carburetors.

FR 19— Findelsen & Kropf Manufacturing Company, Chicago, Ill. Rayfield carburetors.

CG 76— Stromberg Motor Devices ComCA 89— Link-Belt Company, Indianapolis, Ind. Maximum silent chains.

CG 23—
Whitney Manufacturing Company, Hartford, Conn. Whitney chains, special machines, Woodruff keys.

Chains—Tire.

FR 2—
Atlas Chain Company, Brooklyn,
N. Y. Atlas tire chains.
CG 22—

Weed Chain Tire Grip Company, New York, N. Y. Weed tire chains.

Gasoline Storage.

CG 71-72— S. F. Bowser & Co., Inc., Fort

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Wayne, Ind. Bowser fuel and lubricant tanks and pumps.

FR 36**-

Hydraulic Oil Storage Company, Detroit, Mich. Gasoline storage system.

FR 16**-

Milwaukee Oil Pump & Tank Company, Milwaukee, Wis. Gaso-line and oil storage tanks.

Roller Bearings

CG 5b-

Standard Roller Bearing Company, Philadelphia, Penn. Standard roller bearings.

CG 33-

Timken Roller Bearing Company, Canton, O. Timken roller bearings

Automobile Bodies.

CG 1 --

Hayes Manufacturing Company, Detroit, Mich. Bodies, boxes and metal specialties.

Miscellaneous Components.

CG 55_

William Cramp & Sons Ship & Engine Building Company, Philadelphia, Penn. Bronze and bearing metals.

CA 134*-

C. Cowles & Co., New Haven, Conn. Automobile fittings and hardware.

Royal Equipment Company, Bridgeport, Conn. Raymond brakes, Raybestos brake lining.

CA 100-

Sparks - Withington Company, Jackson, Mich. Pressed metal parts.

Metal Tool Boxes, Etc.

CG 1 --

Hayes Manufacturing Company, Detroit, Mich. Metal battery and tool boxes, etc.

Steel Stampings.

CA 131*_

Globe Machine & Stamping Company, Cleveland, O. Hangers, brackets, etc.

Radiators.

CG 24

Briscoe Manufacturing Company, Detroit, Mich. Radiators, sheet metal products.

Kinsey Manufacturing Company, Toledo, O. Radiators, sheet metal products.

CG 36-

McCord Manufacturing Company, Detroit, Mich. Radiators, gaskets, fans, etc.

Motors.

CA 110-Buda Company, Harvey, Ill. Buda

motors CG 62

Continental Motor Manufacturing Company, Muskegon, Mich. Continental motors.

CA 121-

Falls Machine Company, Sheboygan Falls, Wis. Falls motors.

FR 37-38**-

Model Gas Engine Company, Peru, Ind. Motors, transmissions, etc.

CA 1 *-

Model Gas Engine Company, Peru, Ind. Motors, transmissions, etc.

CA 118

Motor Wausheka Company, Wausheka, Ind. Wausheka motors.

CA 123-

Western Motor Company, Marion, Rutenber motors, metal Ind. castings.

FR 17_

Wisconsin Motor Manufacturing Company, Milwaukee, Wis. Wis-consin motors.

Miscellaneous.

CA 149*-

Allen Automobile Specialty Company, New York, N. Y. Fabric specialties, pressure gauges, etc.

CA 94*-

Auburn Auto Pump Company, Boston, Mass. Automobile tire pumps.

FR 14*.

Automatic Motor & Engineering Company, Chicago, Ill.

FR 24*-

S. Breakstone, Chicago, Ill.

FR 20*-

Brown Company, Syracuse, N. Y. Pumps, pressure gauges, etc. FR 28**-

Clucker & Hixon Company, New York, N. Y.

C. M. B. Company, Syracuse, N. Y. Automobile wrenches. FR K

Detroit Lubricator Company, Detroit, Mich. Detroit mechanical oilers.

CA 145*-

Doehler Die Casting Company, Brooklyn, N. Y. Die cast parts.

CA 153*-

Dover Stamping & Manufacturing Company, Cambridge, Mass. Stamped sheet metal specialties.

FR 27**

John L. G. Dykes Company, Chicago, Ill. Tire specialties.

FR 27*.

E. Edelmann & Co., Chicago, Ill.

CA 120-

Esterline Company, Lafayette, Ind. Lighting system.

FR 11**-

Garage Equipment Manufacturing Company, Milwaukee, Wi Miscellaneous metal specialties Wis.

CA 113**-

Hawthorne Manufacturing Company, Bridgeport, Conn. Fourcylinder automobile tire pumps.

FR 15*-

International Metal Polish Company, Indianapolis, Ind. Soaps and metal polish.

CA 151*-

Kellogg Manufacturing Company, Rochester, N. Y. Four-cylinder air pumps.

FR 38*.

Longdin-Brugger Company, Fond-Du-Lac, Wis. Automobile tops, fabric specialties.

FR 10*-

Mayo Manufacturing Company, Chicago, Ill. Spark Plug tire pumps.

FR 33*-

Morrison-Ricker Company, Grinnell, Ia. "Rist-fit" motoring gloves FR 31*_

Frank Mossberg. Attleboro. Mass. Mossberg wrenches.

CA 117**-

Nathan Novelty Manufacturing Company, New York, N. Y. Fab-ric automobile accessories.

FR 16

National Supply Company, Cleveland, O. Tank gauges, vulcanizers.

FR 32-Norton Grinding Company, Worcester, Mass. Emery and other grinding wheels and machines.

CG 70-

Oliver Manufacturing Company. Chicago, Ill. Jacks.

CA 137*-

Pantasote Company, New York, N. Y. Pantasote fabrics. FR 23*-

Peck Wheel Company, Chicago, Ill. Wheels. FR 26*-

Perfect Window Regulator Company, New York, N. Y.

FR 6-

Perfection Spring Cleveland, O. Var Company, Vanadium and Krupp steel springs,

CA 146*-

G. Piel Company, New York, N. Y. Automobile horns.

FR 21a*-

Selbach Rubber Company, Boston, Mass.

CA 136*-

C. A. Shaler, Waupun, Wis. Portable vulcanizers. FR 28*-

Standard Varnish Works, Chicago, Ill. Automobile varnishes. CA 140*-

Start-Lite Company, Chicago, Ill. Gas lighting system. FR 3*-C. O. Tingley, Rahway, N. J. Tire

repair specialties.

CA 125*— Valentine & Co., New York, N. Y. Automobile varnishes.

FR 31**-

Van Cleef Bros., Chicago, Ill.

Publications.

FR 20**-

Automobile Journal Publishing Company, Pawtucket, R. I. Auto-mobile Journal, Motor Truck, Accessory and Garage Journal.

Bicycling World Company, New York, N. Y.

FR 34

Chilton Company, Philadelphia. Penn. Cycle and Automobile Trade Journal, Commercial Car Journal.

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How Long Will a Motor Car Last?

Two factors are responsible for the length of service one may receive from an automobile. One is the quality of the product and the other is the care it receives in service. And each is equally important.

But there is a limit to the life of a well-built car which has received thoughtful care. What that limit is we do not know because there are more Knox cars 10 years old in daily service than those of any other two manufacturers.



Knox Model "R" 40 H. P., 5-Passenger Torpedo Car. One of the Most Popular Knox Models.

This speaks well for the attention these cars have received in the hands of their many owners, but it tells more than this in the quality of material and careful workmanship necessary to last and endure 10 years of the hardest work machinery has ever been forced to stand.

The high standards in practise in the early Knox models have been improved and made even higher in the perfected Knox cars of today.

It is the only business policy that can possibly stand the test of time.

The Knox Is Built to Last and Endure

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KNOX AUTOMOBILE COMPANY, SPRINGFIELD, MASS.

CHICAGO.

THE AUTOMOBILE JOURNAL.

FR 40-

Class Journal Publishing Company, New York, N. Y. Automobile,

FR 35_

Class Journal Publishing Company, New York, N. Y. Motor Age.

FR 1-

Horseless Age Company, New York, N. Y. Horseless Age. CA 140-

Motorcycle Publishing Company, New York, N. Y.

CA 141-

Motorcycling, Chicago, Ill.

FR 12*-

Motor Vehicle Publishing Company, New York, N. Y. Automobile Dealer and Repairer.

FR 30-

New Publication Company, New York, N. Y. Motor.

FR 23**-

Power Wagon Publishing Company, Chicago, Ill. Power Wagon.

*Will exhibit first week only. First week, Part I, the Pleasure Car Show.

**Will exhibit second week only. Second week, Part II, the Power Wagon Show,

CONSTRUCTION DETAILS OF 1912 CARS.

IT IS natural enough that there should be acceptance of certain construction as standard by designers of automobile vehicles. There are many reasons for this, but perhaps the most potent is giving the buyers what they want. While there may be abundant promise in a design it would not be business wisdom to produce it unless there was a substantial confidence obtaining in it on the part of the public. It has been demonstrated that, as building pleasure power vehicles is in every way a business proposition, there is a converging in design toward principles that will justify the confidence of the motorists as a whole. This fact has become more and more strongly emphasized as even casual attention is directed toward the models that are to be found in the market today.

One aim by designers has been simplicity. This has been accomplished by such construction as will endure during continuous and protracted periods of service, and every known possibility for complication has been eliminated or minimized. In considering the fact that the endeavors of the designers are largely in similar, if not the same, channels, it is interesting to take as a foundation for analysis 171 different makes of cars, numbering no less than 366 different models. As models of the same make of car may differ materially it has been believed best to take up the total of cars for consideration.

It would be idle to assume that engine design is studied with only utility in mind. It is true the endurance and efficiency, with a minimum of possible causes for failure, are distinct aims, but it is also a fact that it is the purpose of every designer to minimize the cost of manufacturing without sacrifice of any quality, and, if possible, to improve the car in every detail. The people will buy a wholesome and well constructed machine that is designed on proven lines and for this reason it is well to retain whatever is known by motorists and will commend the vehicle to others.

Motor Cylinder Casting.

There are innumerable qualities that might be commended, but it is extremely improbable that one will find in one construction what will have all the virtues and what will please all. Taking up a number of the general features of design of the 1912 cars and considering the matter of motor building the following indicates the choice of cylinder construction better than any other illustration:

No.	P. C.
Triplets 9	2,46
En bloc 67	18.35
Single 82	22,48
Pairs 207	56.71
365	100.00

Cylinder Type.

Taking up the matter of cylinder casting it will be noted that there is a decided difference of opinion as regards the design of the cylinder head, but there is practically double the number employing the L form of head than employ the T type, which is the next in point of popularity. It is interesting to note that the series of cars includes but 12 that have two-cycle engines, and but four the Knight or sleeve valve form. There is, apparently, no diminution of the I form of cylinder, in which the head is cast separately. This tabulation follows:

	No.	P. C.
Sleeve		1.11
Two-cycle		3.34
I Type	. 37	10.18
T Head	. 103	28.36
L Head	207	57.01
i		
	363	100.00

Valve Location.

Many engineers now give a protection to their motors by enclosing so far as this may be done the moving parts, and a practise becoming very general is to prevent accumulations of dust and other abrasive material on the valve stems and pushrods by plates that may be easily removed when necessary. Such practise is as a rule adopted when the valves are located on one side, but in some instances the valves have been protected by other means. The choice of location of the valves is indicated as follows:

	No.	P. C.
Sleeve	4	1,13
Side and Head	14	3.98
Side	36	10.25
Right Side	37	10,55
Head	41	11.69
Opposite	104	29.63
Left Side	115	32.77
	351	100.00

Radiation, or Cooling.

For the radiation of the heat of the motors, out of 365 different makes of cars but 5.75 per cent. employ a draft of air, the remainder utilizing water. There has been no gain in ratio of air-cooling, there being but two prominent makers who construct this form. The percentage of the different forms of radiation is shown as follows:

	No.	P. C.
Air draft	21	5.75
Thermo-syphon	78	21.37
Pump circulation		72.88
-		
	RRK	100 00

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Motor Lubrication.

In the lubrication of the motor there are but two forms generally used, though with some of the two-cycle engines the lubrication is supplied in connection with the fuel. There is a very general adoption of the splash method, while splash is also used by those who supply lubrication in part by means of a positive form of oil pumpage. The different methods of lubricating the motor are shown as follows:

	No.	P. C.
In Fuel	7	1.94
Mechanical force feed	62	17.17
Splash	292	80.89
	361	100.00

Type of Radiators.

There are practically but two types of radiators used by those who cool their motors by water, these being the honeycomb and the tubular. The relative proportions of these types in the cars considered are shown thus:

Tubulon		No.	P. C. 43.07
			56.93
	•		
		346	100.00

Ignition Systems.

Because of the absence of specific information relative to the exact character of sources of electric current used for ignition in the motors it is difficult to give figures that may be regarded as absolutely trustworthy. With many cars the system consists of the storage battery for starting and a spare, and the magneto for continued operation. With a comparatively few is there use of the dry cell battery alone, while there is a growing tendency with the builders of small machines to use a magneto alone, this instrument being regarded as being sufficiently dependable to justify its installation without a reserve. In addition a considerable number of cars are now equipped with a storage battery of considerable proportions which is utilized for lighting purposes as well as supplying whatever current may be necessary for starting, or in emergency.

There appears to be no standard definition of the phrases used to describe some of the systems. The word double appears to have been confused with dual, for both have been employed with reference to ignition systems. In any event neither adequately represents the conditions that it is desired to emphasize. It may be assumed that dual means two different systems, or that double means two systems of the same nature, both available for use each independent of the other. According to the designations of the builders the ignition systems are as follows:

No.	P. C.
Optional 4	1.09
Single 53	14,52
Double 88	24.11
Dual 220	60.28
365	100.00

Ignition Control.

With the great majority of the manufacturers the power of the motor is in part controlled by the advancing or retarding of the point of firing with reference to piston position. There are several makes of

cars which have the firing point fixed, while others control the ignition by means of a governor. The relative percentages of these equipments are:

	Nď.	P. C.
Governor	7	1.98
Fixed	21	5.95
Hand Control	325	92.07
	353	100.00

Clutching Devices.

In the types of clutching devices that are used there appears to be little to choose between the cone and the multiple disc, both of which have about the same number of users, but four other types are divided among 24 different models. The summary of clutches in 349 different cars shows the following:

	No.	P. C.
Cone and Disc	1	.29
Dry Plate	1	.29
Contracting Band	6	1.72
Expanding Band	6	1.72
Expanding	10	2.86
Multiple Disc	161	46.13
Cone	164	46.99
	349	100.00

Transmissions.

In the gearset or mechanism for varying the speed of the vehicle there is no question that the sliding gear is preferred and that this has been appreciated by the designers. In fact approximately 90 per cent. of the models considered have this form of transmission, a term that has been generally accepted as applying to this part of the power transmitting system. The progressive method of engaging gears has also been discarded by many. The comparison of the models shows the following:

	No.	P. C.
Planetary	7	1.91
Progressive	11	3.01
Friction	17	4.66
Selective sliding gear	330	90.42
-		
	365	100.00

Rear Axle Drive.

More than 90 per cent. of the 366 models under consideration are driven by shaft, which is a sufficient commentary on the form of power transmission that is approved by the people. Of the 171 makes but one uses the roller, while several employ either the single or the double chain. The relative proportions of these types the vogue are shown by the following:

		1		No.	P. C.
Roller				3	.82
Chain	(single).			10	2.73
Chain	(double)			14	3.83
Shaft				3 39	92.62
				266	100.00

Rear Axle Construction.

But comparatively few of the models have axle equipment known as dead, but the greater number have the full floating type in which the weight of the car and its passengers is carried on the axle housing and not on the axles. With the semi-floating axle the axle shafts generally carry the weight. The following comparison shows that the floating construction is receiving the approval of the largest number:

	No.	P. C.
Dead	18	4.96
Semi-Floating		41.32
Floating		53.72
•		
	363	100.00

Front Axle Types.

There is practically one choice evidenced for front axles in the models that are under consideration. There is a somewhat uncertain description used by some of the makers because the word "channel" as applied would also adequately describe the I section form that has been very generally adopted. The following will illustrate the differing forms employed:

	No.	P. C.
Wood	. 1	.27
Floating	. 1	.27
Box	. 1	.27
Round	. 1	.27
Channel	. 11	3.01
Tube	. 31	8.47
I Section	. 320	87.44
	366	100.00

Fuel Supply.

The number of makers who approve the gravity feed of the fuel for the motor is surprisingly large. In fact more than 80 per cent, believe that this form of construction is more satisfactory, being less complicated and very efficient under the ordinary conditions of use. A few makers will provide either accepted form of supply at the option of the purchaser. The following summarizes this feature of the machines:

		No.	P. C.
Optional		5 `	1.38
	Feed		17.41
Gravity	Feed	294	81.21
	-		
		362	100.00

Types of Motors.

Of the type of motors so far as number of cylinders is concerned more than four-fifths are of four cylinders, and the next highest number is of six cylinders. The remainder, of one, two, three and five-cylinder machines, aggregates less than five per cent. The following tabulation is really surprising and is decidedly significant.

Motor	No.	P. C.
1-Cylinder	 1	.273
2-Cylinder	 9	2.459
3-Cylinder	 2	.546
4-Cylinder	 293	80.055
5-Cylinder	 1	.273
		16.394
	366	100.000

LICENSED ASSOCIATION DISSOLVED.

Although the Association of Licensed Automobile Manufacturers, composed of those makers of motor cars licensed under the so-called Selden patent, practically has been out of existence since the closing of the Madison Square Garden show of 1911, during which the final decision of the courts was rendered on this patent, the annual meeting of the organization was held in New York City, Jan. 10. At this meeting final action was taken toward dissolving the association, the members voting to close up its affairs and to arrange for the Automobile Board of Trade to succeed it. As a matter of fact, this action was purely formal, since the Automobile Board of Trade has been carrying on the work of the old Association of Licensed Automobile Manufacturers, with the exception of issuing licenses, etc., for nearly a year. Col. Charles Clifton, president of the organization for the past seven years, rendered his final report, and a unanimous vote of thanks was tendered to the officers and executive committee for their services in advancing the interests of motor car manufacturing with its resultant benefits to the user.

CONTEST ASSOCIATION MEETING.

The annual meeting of the Manufacturers' Contest Association was held in New York City during the progress of the first week of the Madison Square Garden show, most of the officers being re-elected as follows: President, Howard E. Coffin, Hudson Motor Car Company; vice president, A. L. Riker, Locomobile Company of America; secretary-treasurer, E. R. Hollander, Fiat Automobile Company; assistant secretary-treasurer, Russell A. Field. Mr. Riker is the only new official. The board of directors chosen is composed of Messrs. Coffin, Riker and Hollander; George

M. Dickson, National Motor Vehicle Company; C. T. Emise, Lozier Motor Company. Howard Marmon, Nordyke & Marmon Company, remains as chairman of the rules committee. The advisory committee to the contest board of the American Automobile Association remains as follows: S. A. Miles, National Association of Automobile Manufacturers; H. E. Bonnell, Automobile Board of Trade; Jesse Froehlich, Benz Auto Import Company, the latter representing the importers. The following committee was appointed to confer with representatives of the American Automobile Association for the purpose of formulating a policy for the future government of contests: Mr. Hollander, Mr. Riker, Mr. Emise, M. C. Meigs, Pierce Motor Company, and P. D. Wagoner, General Vehicle Company.

GROWTH OF TIRE INDUSTRY.

An idea of the growth of the motor car industry and its allied interests may be gathered from an estimate of the number of tires which have been manufared in this country during the past five years. Such an estimate has been made by R. E. Drake, manager of the service department of the United States Tire Company, New York City, who gives his findings as follows:

"Since the beginning of 1907, the tire makers of America have marketed in the neighborhood of 8,000,000 pneumatic tires, the yearly output being as follows: 1907, 900,000; 1908, 1,050,000; 1909, 1,350,000; 1910, 1,800,000; 1911, 2,900,000. While 1911 proved the largest year for tire makers, we are looking for a demand that will approximate 4,000,000 tires during 1912. And when these figures are considered it is possible to gain an impression of the wonderful proportions of the industry."





We Don't Know How to Get More Than Our Goods are Worth

We don't over-pay when we buy and we don't over-charge when we sell.'
We have always credited the other man with just as much common sense and just as much commercial judgment as we possess.

We had a business training before we had a speedometer training and it taught us that the way to make a lot of money is to make a lot of goods and a very little on each sale.

So we aimed at output from the very outset.

We built a factory that would give us output.

We believed that the automobile business would grow and that there was no risk in planning to grow with it. We installed the finest machinery that money could buy, and when we could not find it good enough we had it made special.

it made special. We calcula We calculated that the day would come when speedometers would have to be sold at a normal margin. and when we found the exorbitant profits that were being charged, we figured that the time to start figuring down to bedrock was the first day that we went out for orders.

That's why four cars out of five carry Stewart Speedometers. Eighty per cent of car owners are so level-headed that they make sure they are getting the utmost for their money.

of car owners are so level-headed that they make sure they are getting the utmost for their money.

If the Stewart were not more accurate—were not built stronger, were not more reliable—somebody else would be selling four speedometers to our one.

There's no test like the test of sales.

Magnetic principle—jewel bearings—wearing parts hardened and polished—open dial—large figures—easily read—absolutely accurate—100,000-mile season odometer—100-mile trip register, can be reset to any tenth of a mile—guaranteed for five years—strongest flexible shaft drop forged swivel joint—noiseless goars.

"ALWAYS ON THE JOB"

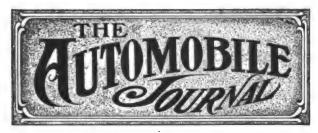
Stewart & Clark Manufacturing Company 1926 Diversey Boulevard, Chicago, U. S. A.

Speedometers, \$15 to \$30 Clock combinations, \$45 to \$70 Detroit

San Francisco

New York Minneapolis Los Angeles

Chicago Kansas City London



VOL. XXXII.

NO. 12.

Published the 10th and the 25th of Each Month.

William H. Black, Treasurer.

D. O. Black, Jr., Secretary.

ADVERTISING DEPARTMENT.

NEW YORK DETROIT CHICAGO BOSTON

W. R. Blodgett C. A. Eldredge P. G. Lurian John W. Queen 25 42nd Street 304 Sun Building 1614 Belle Plaine Avenue 6 Beacon Street

Subscriptions :

The United States and Mexico, the year, \$1 in advance, Canada and Foreign Countries in Postal Union, the year, \$2 in advance. Ten cents the copy.

Advertising Rates:

Information given at request. All advertising copy to insure publication must reach this office 10 days preceding the date of issue.

Remittances should be made by Check, Draft, Postoffice, Express Money Order, or Registered Letter. Money enclosures must be at sender's risk.

Entered as second class matter, April 16th, 1906, at the Postoffice at Pawtucket, R. I., under the Act of Congress of March 3rd, 1879.

VALUE OF AUTOMOBILE SHOWS.

The advancement of the motor car industry cannot be traced to any one thing. Contest work, touring and shows, each have played their important part in bringing out certain features of design and construction. Most manufacturers realize this, although there is sentiment in certain quarters to question the advisability of expending the large sums necessary to produce the exhibits for the annual displays of so-called national character.

Apart from the consideration of prospective purchasers, many of whom have declined to make decision until they have had opportunity to study the various models side by side under one roof, there is a well defined value in assembling the products of the industry for the inspection of dealers. These annual displays have come to be regarded by the local agencies much in the nature of a national convention, at which they meet the manufacturers and discuss the needs of their respective territories. It cannot be held that those engaged in the sale of motor cars are any better equipped to decide what is best than are the engineers of the manufacturing companies, but experience has indicated that such suggestions are of permanent value in determining certain well defined improvements.

Then, too, it is to be noted that the engineers do not fail to grasp the opportunity for studying new features which might not be called to their attention in another manner. During the shows many of these

officials are to be seen, note book in hand, visiting each of the exhibition spaces in turn. This comparison of ideas and careful study of new development has been reflected in no small degree at each succeeding display.

Of course, the stimulating effect upon business is the chief aim of the automobile show, but it must not be considered that this is the sole advantage to be obtained. The present condition of the industry as a whole may be traced in no small measure to the suggestions that have been made by users, prospective buyers and dealers, quite as much as to the study and experimentation of the engineering department. And while it is true that modern automobile construction has reached a point where changes naturally will be more in the nature of refinements than innovations, for the most part, future development along these lines will be determined even more largely by the desires of the user for comfort, economy and reliability.

Massachusetts demands that every vehicle using the public highways during the hours of darkness shall be equipped with suitable lights. Why don't you advocate a similar measure for your state? Now is the time to act

SUCCESS OF COMMERCIAL CAR.

The growth of the commercial vehicle side of the industry during the past year has proven something of a revelation even to those who had made a careful study of the situation and were convinced of its remarkable future. When it was decided to hold separate exhibitions for industrial transports in New York and Chicago in 1911, there were many who doubted the wisdom of the project. Reports indicated that these were productive of large possibilities in a business way, and that there was no hesitancy regarding a continuation of the plan for 1912.

Manufacturers realize there are certain problems confronting them in meeting the demands of the user, but in each instance there is a determination to solve them in a manner which shall be permanent. That the power wagon is thoroughly practical and efficient has been determined beyond a shadow of doubt. The only questions are those which affect the individual situation, and these can be approached only as they appear. The business man who desires to replace his horse drawn equipment with that which will meet better his service requirements has only to state his proposition.

The satisfactory solution of difficulties which arose in so-called pleasure vehicle production has permitted the motor truck maker to start well in advance of his predecessor. The manufacture of commercial vehicles, which may have been regarded as in its infancy a year ago, has now become a decided factor in the economic situation. There appears to be no limitation as to its progress during the next twelvemonth.

Universal lighting and uniform laws are the prime necessities for safe and sane motoring.



UNIVERSAL LIGHTING BILLS.

The introduction of so-called universal lighting bills, in which all vehicles utilizing the highways during the hours of darkness are required to display some form of light, has begun in a number of states. Thus far, the proposed legislation seems to be modelled upon that which has been working so satisfactorily in Massachusetts during the past year. Reports from that state indicate that the new law is being observed very generally, although there has been little disposition to enforce it strictly until it is thoroughly understood.

It will be remembered there was determined opposition to the measure in the Massachusetts Legislature, and it is to be presumed that organized motorists will find some of the same feeling in other commonwealths. But as the innovation is being worked out, its bitterest enemies are beginning to realize that it really works no hardship upon anybody, and that the highways are eminently better safeguarded than under the old regime. There ought to be no difficulty in securing sufficient arguments to convince the most skeptical legislator that the reform has come to stay.

Advocate the use of lights on all vehicles using the public ways during the hours of darkness.

OPPORTUNITIES IN SOUTH AMERICA.

The United States appears to have paid considerable more attention to the development of business in South America during 1911, with the result that much of the trade which formerly went to France, England and Germany is now being diverted to this country. That this continent offers splendid opportunities for the automobile industry has been evident for some years, but American manufacturers do not seem to have had the time or the inclination to develop it in a proper manner. There is little doubt conditions are such that methods which apply in other parts of the world need decided revision, but if European makers can meet these there should be no reason why Americans cannot.

It is stated on good authority that the individual wealth of the people of Brazil, for instance, is greater than that of the United States. Road conditions are sufficiently good to warrant the use of motor vehicles. The question of tariff applies equally to all foreigners. The main proposition is in the method of approach. There is little use in depending upon mails, since it takes three weeks for a letter to reach Rio Janeiro from New York. The manufacturer who secures the business must maintain a factory selling branch with sufficient cars and parts on hand to present something tangible. Some makers already have adopted this policy with success.

Uniform motoring laws would end the needless confusion attendant upon interstate touring. Now is the time to advocate their passage.

GOVERNOR BALDWIN IS VINDICATED.

A little more than a year ago, during his inaugural address, Governor Simeon Baldwin of Connecticut, who was a justice of the Supreme Court in that state before he decided to accept the Democratic nomination for the office he now holds, occasioned some little surprise by recommending the passage of a law regulating the use of flying machines. Conservative citizens laughed the governor to scorn, contending that the aeroplane had by no means reached a point where it was proper to dignify it by an act of the Legislature. However, the executive made it plain he was in earnest about the matter, and a law drawn up by him was passed, giving Connecticut the honor of passing the first legislation with reference to the new science.

Now comes the information that President Fallieres of France has signed a law passed by the French Chamber and Senate which embodies all of the points covered by the Connecticut statute. Inasmuch as France generally is conceded to be far ahead of America in the matter of aviation, Governor Baldwin naturally is somewhat pleased to find his ideas given such prominent indorsement by that country.

Automobilists should advocate uniform motoring laws, because in no other way can the present confusion of interstate touring be avoided.

MOTORCYCLES FOR BUSINESS PURPOSES.

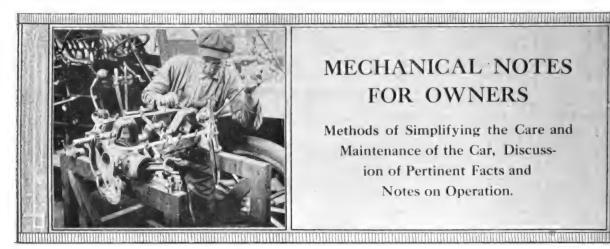
In marked contrast with the result of the exhibition of motorcycles held in connection with power wagons at the Madison Square Garden show in New York City in 1911, the business done by manufacturers of these vehicles this year was decidedly successful. Many agencies were closed during the week of display and in each instance the representatives expressed themselves as particularly pleased with the new plan.

Heretofore the motorcycle has been regarded largely as a pleasure machine, used almost solely by young men for purposes of recreation. During the past year, considerable long distance touring has brought the attention of the public more particularly to the two-wheeled mount. It is significant that many business men are beginning to utilize these vehicles in going to and from the office, and this feature, which has been in vogue for some years in the Middle West, is placing a new value upon their production, which the maker is not slow to grasp.

One other development indicated by the show is the introduction of side cars. These have proven decidedly popular in England and on the Continent, and it remains to be seen how the American public will regard them. They have a number of good selling points, though they may find a determined competitor in the low priced automobile.

Motorists should see that their individual states require lights on all vehicles using the highways at night

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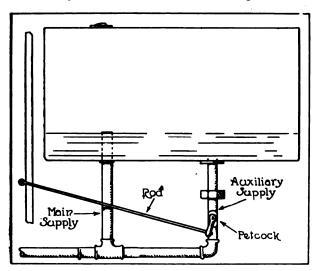
MECHANICAL NOTES FOR OWNERS

Methods of Simplifying the Care and Maintenance of the Car, Discussion of Pertinent Facts and Notes on Operation.

AUXILIARY FUEL DEVICE.

Although the majority of the new cars are fitted with auxiliary fuel tanks, many machines are not so equipped. Such containers are built into the regular member and so arranged that the fluid is prevented from flowing into the main line by some form of shut-off valve. When the latter is opened the auxiliary gasoline runs through the regular channels to the carburetor.

The object of the reserve tank is to provide the



-Simple Method of Converting a Fuel Tank Into an Auxiliary Member.

motorist with fuel when the main supply has become exhausted. The operator who has not become stalled for lack of fuel is the exception rather than the rule, and often he is stranded some distance from a source of supply. Then again, many automobilists assume they have enough fuel and do not examine the tank.

At Fig. 1 is presented a simple method of converting the regular fuel container into an auxiliary member and the work is not difficult or costly. It can be performed by anyone familiar with the use of the soldering iron and possessing a slight knowledge of fitting brass piping connections.

It will be noted that the usual supply pipe leading from the tank is utilized for the auxiliary line and that a petcock is incorporated therein. To the lever of the petcock is attached a rod which leads to and through the seat partition, and which is fitted with a ring handle. In the sketch the petcock is depicted closed and when the auxiliary fuel is desired, the handle is pulled out, which movement opens the

The regular supply of gasoline is obtained through a pipe which is cut into the main line and extended upward into the regular vessel. The height of the tubing will depend upon the capacity of the fuel container and the supply of auxiliary fuel desired. This may be determined by measuring the tank in the usual manner.

When the tank is filled with gasoline, the fuel will flow until the level of the standpipe is reached. The motor will then stop, denoting to the operator that the main supply has become exhausted. The rod leading to the petcock is then pulled forward, an operation that may be performed without the driver leaving the seat, and the reserve fuel is brought into service.

In fitting the standpipe to the tank care should be exercised in soldering because of the danger of the the gasoline vaporizing. Any plumber will fit the part needed and if one be not familiar with soldering, it would be best to have the work done by an expert. A shut-off valve may be incorporated in the pipe and located near the carburetor, which is decidedly more convenient than crawling underneath the machine to reach the usual member.

TREATING A FROZEN CAR.

If a car has been exposed to the cold for any length of time and it is thought that the water is partially or wholly frozen, an examination should be made before attempting to crank the motor, especially if a circulating pump be fitted to the system. If the frozen fluid bind this member it is liable to become damaged as considerable leverage is exerted upon this part by the gears operating the driving shaft.

It is an excellent plan to test the circulating system for symptoms of freezing and this may be accomplished by opening the petcock under the radiator



and pump, and if the water does not flow, and the openings be not stopped up, it is reasonable to presume that the parts are frozen. It may be that the fluid in the radiator is not affected, especially if it has been protected by heavy robes, but this condition may exist with the pump, which has been exposed to the cold.

When frozen the car should be thawed out gradually, as the application of hot water to the parts may result in damage. All petcocks should be left open and the water allowed to flow. The circulating system may then be tested for leaks and these repaired.

CARE OF GENERATORS.

Many motorists utilize a generator in producing acetylene for the headlights and as these devices are fitted with water jackets they should not be wholly filled with the fluid. The object of the jackets is to keep the gas cool as considerable heat is given off in the generation of acetylene. In cold weather the fluid in jackets can be dispensed with or an anti-freezing mixture may be introduced. Regarding the use of alcohol in the compartment feeding water to the

paper is placed between the contact points and the trembler blade raised until a slight pressure is brought to bear against the paper. The latter is then moved back and forth, taking care to keep it perfectly horizontal. After cleaning the adjusting screw member the paper is reversed and the operation repeated. This will clean the points which will be left perfectly true. Members that have been filed out of true may be aligned by this treatment which is applicable to similar parts, such as on a magneto or the anvils and hammers of the make and break ignition.

RADIATOR CAP SAFETY DEVICE.

Radiator caps sometimes work loose and often this is due to their not being screwed up tightly when replacing the part after replenishing the water supply. As the caps invariably are lost while on the road, and are seldom recovered, a temporary repair may be made with a piece of chamois until a new part can be obtained.

A device which is easily constructed and applied, to prevent a loss of the cap, is illustrated at Fig. 2 B. It consists of a chain, one end of which is attached to the cap, while at the other is fastened a bar longer

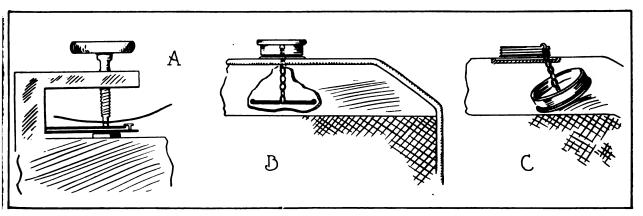


Fig. 2—Practical Hints to Owners: A, Cleaning and Aligning Platinum Points of the Coil Without Removing the Parts; B, Safety Device to Prevent Loss of Radiator Cap: C, Depicting How the Member Is Retained.

carbide, opinions vary as to the results obtained. If the garage be not heated it is a good plan to disconnect the generator and store it in a warm place.

CLEANING PLATINUM POINTS.

The efficiency of the spark coil of the vibrating type depends largely upon the condition of the platinum points of the adjusting screw and trembler blade. If these be burned or pitted considerable more current will be required to overcome the resistance, and often their condition is such that the operation of the motor is affected.

Some points pit more easily than others, and this may be due to a poor adjustment or impure metal. The usual method of cleaning the points is to remove them and utilize a file, or some device that will permit of removing the pits without creating an uneven surface.

At Fig. 2 A is shown a simple method of cleaning the parts and the operation may be performed without changing the adjustment, which is necessary when the members are removed. A strip of fine emery

than the width of the radiator opening.

The length of the bar should be slightly less than the inside width of the radiator so that in screwing or removing the cap, the bar will turn. At C is shown a cap that has worked loose and was prevented from being lost by the chain attachment. The device costs but a few cents to make.

PLANETARY TRANSMISSION TIPS.

The planetary transmission is simple, easy to operate, but requires care. While this type seldom gives trouble other than readjusting or relining the bands, the high speed plate will slip at times and when this occurs the member must be taken up.

In adjusting this part the lock nut is loosened and the collar turned clockwise. Before locking the part the hand or operating lever should be worked to see if the speed locks easily. If after this the clutch still slips, and further adjustments do not bring about the desired results, and considerable strength is required to lock the lever in position, it is well to examine the high speed plate and note if it be not

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cracked. Sometimes these members will split and when locked against the fibre plate, will spread and fail to grip properly. It is difficult to repair these members and the easiest and cheapest way is to purchase a new one.

If upon setting the high or low speeds, they hold properly when being utilized, they should be tested to note if they are dragging. This may be accomplished with the motor idle, clutch out and the brakes released. If upon cranking the motor the machine has a tendency to roll forward, the bands should be examined to see if they are gripping too harshly. It may be that the lining has become worn and that the material does not make a good contact except in one or two places of the circle.

When these conditions exist the friction set up will heat the casing unduly and if the transmission be worn, the lubricant will melt and run out. Sometimes the springs holding the bands open when not in use, lose their elasticity. The latter should not press against the metal and if adjusted properly will contact sufficiently to perform their work and at the same time will not produce undue friction.

PROPER CARE OF TRANSMISSION.

One of the most important parts of the motor car mechanism is the transmission and this member should receive the care suggested by the maker in his book of instructions. After a new car has been run about 200 miles the cover to the gearbox should be removed, the grease cleaned out and the gears and casing washed thoroughly with kerosene. A good, stiff brush will facilitate the operation. The object of this treatment is to remove all foreign elements which may have collected in the gearbox, either in the assembling of the mechanism or otherwise.

Thereafter the cleaning should be performed every 2000 miles, although some transmissions will require it oftener. Many motorists make it a practise to open the gearbox and add lubricant from time to time, but do not stop to think that it requires a thorough cleaning to remove the particles of steel that may be chipped from the gears, or the old grease that may have become caked, thus preventing the bearings from receiving the proper amount of lubricant. Merely keeping up the level of the lubricant is not sufficient, and many owners who have had to renew bearings would have been saved the expense had they followed the suggestions of the maker.

CARBURETOR FAILED TO RESPOND.

When attempting to adjust the carburetor from the seat on some cars and satisfactory results do not follow, it is an excellent plan to lift the hood and note if the forked member fitted to the needle valve part is in proper order. An instance of an operator trying for some time to set his vaporizer from the seat without results was noted by the writer recently. Upon lifting the hood it was discovered that the forked member had slipped from the head of the adjusting screw.

CLEANING THE CRANKCASE.

A clean, high grade oil is essential for properly lubricating the motor, and while the motorist will

replenish the supply and feed enough of the fluid to the working parts, he is prone to neglect cleaning the crankcase of the old lubricant and flushing it out with kerosene as directed by the maker.

In some types of engines the petcocks or drain plugs are so located that this is an easy task, while others are constructed with recesses and these retain more or less sediment. Sometimes the front end of the machine is elevated to drain these compartments

It is a simple matter to equip the crankcase with either drain plugs or petcocks. The former are inexpensive and fitted easily. In drilling and tapping the holes for these members it is best to remove the lower half of the crankcase, but the work may be performed with the part on the motor. When the latter is fitted with four openings the work of cleansing the crankcase is facilitated and every bit of dirt may be flushed out easily with kerosene.

HOME MADE FOOT WARMER.

Old inner tubes are utilized for many purposes. One of these was converted into a foot warmer by a motorist who possessed a portable vulcanizing outfit, and who made his own tire repairs. A good section, about two feet long, was cut from an old tube and one end vulcanized. Taking the nipple from an old hot water bottle that was beyond repair, the part was fitted to the other end of the tube and vulcanized. When filled the vessel held a considerable quantity of hot water which retained its heat for some time. In service the warmer was wrapped in a cloth and placed in the tonneau, giving excellent results.

CRACKED INTAKE MANIFOLDS.

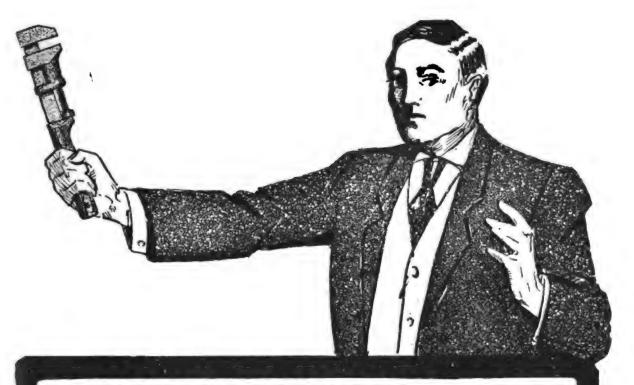
In fitting new gaskets between the intake manifold and the cylinder care should be exercised in tightening up the nuts on the studs, especially if the design of the intake pipe be such that a slight strain will crack the member. When the latter is of aluminum, and of light construction, it is cracked easily and sometimes the break will be so small as to be hardly perceptible to the eye. As a tiny opening will admit air the mixture consequently is weakened and the motor will run irregularly at low speeds but operate correctly at a higher rate. When the crack is a small one, a temporary repair may be made with thick shellac, applying several coats of the solution and allowing each to dry thoroughly. This repair will last for a considerable time and the writer operated a car an entire season under similar conditions.

THE USEFUL MIRROR.

A mirror of the round, vest pocket type is a handy addition to the tool outfit. It may be used either in the day time or night to reflect the rays of light so as to be thrown into dark places of the car when seeking a lost nut or cotter pin.

Sometimes difficulty is experienced in removing a spark plug from the cylinder. Frequently the porcelain is broken by a too vigorous application of the wrench, or if heat is utilized the insulator may be cracked. It is an easy matter to loosen the retaining nut of the latter and remove the part, after which the stubborn member may be handled easily.

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LEADING CUTTING MODELS FOR 1912.

THE line produced for the present season by the Clarke-Carter Automobile Company, Jackson, Mich., maker of Cutting cars, consists of six models. This is the same number as was built during 1911, but two new types have been created and two discontinued, while two have been changed and given other designation. These productions meet with practically every requirement of the motorist, the machines ranging from the 30 horsepower torpedo roadster to the 50 horsepower seven-passenger touring car.

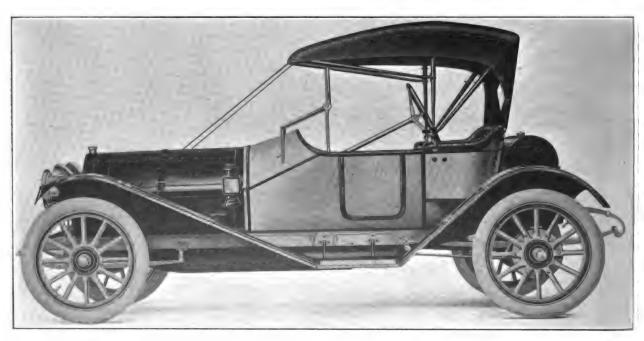
These cars represent what may be regarded as the machine of moderate cost in which every character of service may be anticipated and realized. The policy of the Clarke-Carter company has been to produce vehicles that will meet with the demands of all motorists,—rather an ambitious undertaking, but examina-

senger roadster is unchanged, but there is material difference in the chassis for this type as compared with the 1911 creation.

The A-30 is regarded as a popular machine from every viewpoint in that it has speed, appearance, long wheelbase, easy riding qualities, and admirable equipment. Because this same chassis is fitted with several bodies and that it has been materially refined and perfected a description of this, which will detail the improvements, is in every way fitting and opportune.

L Type Motor Cast En Bloc.

The motor is of the L type with the four cylinders cast en bloc, this being in keeping with a practise that has been very often adopted for engines of much larger power rating. The bore is four inches, an increase of .25 inch as compared with the 1911 model,



The Cutting 1912 Model A-30 80 Horsepower Torpedo Roadster,

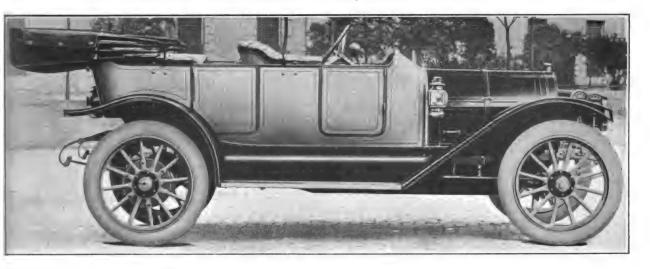
tion of the different models will demonstrate that they are not only very carefully designed and developed but the materials used are chosen with regard to service and endurance as well as appearance.

For the three smaller models, the A-30 torpedo roadster, the T-35 torpedo five-passenger touring car, and the D-35 fore door five-passenger touring car one chassis is used. For the D-40 fore door five-passenger touring car the second size is employed. The third size is for the T-55 torpedo five-passenger touring car, and the fourth is the F-60 fore door seven-passenger touring car, this being the largest machine turned out.

The first two models are different only so far as body equipment is concerned and as this type has been developed with a view to satisfying the requirements of a large and discriminating class of motorists particular attention has been directed toward mechanical refinement. The A-30 designation of the two-pas-

and the stroke is five inches, which has been unchanged. This materially increases the horsepower of the engine. The cylinder block is of a high grade of gray iron and it is cast with the water jacket integral, there being sufficient spaces to insure complete cooling of the motor. The valve pockets are at the left side of the motor and the intake manifold is at the right side, being integral with the cylinder block and water jacketed, with the intake between the second and third cylinders.

The cylinder en bloc construction may be made extremely light and yet in every way rigid and strong. The design is such that the top of the water jacket is open in the block, this making it possible to thoroughly free the casting of the core, and the opening is closed in the assembly by a large plate secured to the block by cap screws. In this plate is a central channel leading from the rear of the engine to the front where it terminates in a large nozzle or snout, which



New Cutting 1912 Model T-35 30 Horsepower Five-Passenger Touring Car.

is the outlet for the water and which is connected with the radiator. This construction permits almost unrestricted flow of the cooling water to the radiator, a factor of much importance in securing effective radiation.

Engine Case in Three Parts.

The engine base is of aluminum and it is cast in three sections. The first or lower part of the case is practically a reservoir for the lubricant. The upper section of the case contains the main bearings, so that the lower half may be removed without affecting the condition of the journals. The third portion of the case forms the front or forward end and covers the timing gears. The design of the case is such as to insure maximum strength with minimum weight, while it is possible at any time to have access to the main, connecting rod or camshaft bearings, or to the timing gears, without dismantling the motor.

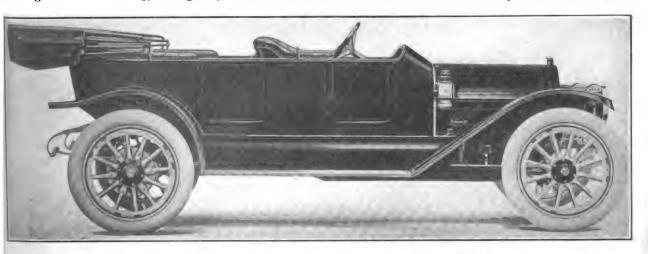
The crankshaft is carried on three plain journals and is 1.75 inches in diameter, this size insuring perfect alignment under all conditions of service. Not only this, the unusually large shaft is carried in front and centre bearings 2.75 inches in length and a rear bearing four inches long, this giving 9.5 inches of

bearing length for the shaft. The bearings are of Parsons' white bronze and are especially durable. Each of the bearing caps is secured with four bolts, which insures a positive rigidity and constant alignment.

Pistons and Connecting Rods.

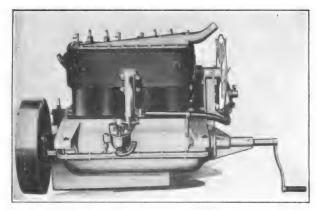
The pistons are of a high grade of gray iron and are carefully turned, aged and ground to size. The pistons are the full length of the stroke and are cut for four rings, each .25 inch in width, the rings being accurately ground to fit. The rings are bevel cut and insure a positive degree of compression. The pistons are cut for three oil grooves to make certain the lubrication of the cylinder walls.

The connecting rods are drop forgings of 30 per cent. carbon open hearth steel, heat treated, 10.5 inches in length. The big ends are with bearings 2.75 inches in length, a construction that makes for great durability and certainty of service, and the upper ends carry the wristpins, which are fixed and oscillate in bearings in the piston bosses, the pins having bearings 2.5 inches in length. It will be noted that every bearing surface has been made large that the greatest degree of wear may be obtained with reasonable attention. The wristpins are 1.187 inches



New Cutting 1912 Model T-55 50 Horsepower Five-Passenger Touring Car, Price \$1850, Fully Equipped. Made by the Clarke-Carter Automobile Company, Jackson, Mich,

diameter and are of case hardened steel. The camshaft is .937 inch diameter and it is drop forged with all cams integral. It is carefully ground to size. The



Left Side of the 30 Horsepower Cutting Motor.

bearings are liberal and are of Parsons' white bronze.

Valves Operated by One Camshaft.

The valves are carried at the left side of the motor and are operated by the single camshaft. exhaust manifold is installed by stud bolts and extends along the side of the block so that there is no obstruction to access to the valve mechanism. manifold is ribbed longitudinally so as to increase the radiation and facilitate cooling. The valves are 1.687 inches diameter with ports 1.5 inches diameter, the liberal size making certain complete charging with fuel at each aspiration and thorough scavenging of the cylinder with each exhaust stroke. The valves have steel stems and nickel steel heads, electrically welded, this construction affording long endurance. The valve stem guides, the valve stems, the pushrods, pushrod guides and springs are all enclosed in pockets under offset of the cylinder block by plates that are retained by large thumb nuts and may be removed in a few seconds for the purpose of inspection. The valve stems and pushrods may be adjusted as desired and inserts of fibre effectually silence the operation of the mechanism. The protection of the working parts against all abrasive substances and water makes for long and continued wear with minimized adjustment.

The System of Radiation.

The motor is cooled by water circulated through a cellular radiator of handsome design by means of a centrifugal pump. The capacity of the system is such as will insure effective radiation under all conditions of service. The water is drawn from the radiator by the pump, which is driven off the camshaft extension and is enclosed in an aluminum housing. The lead from the pump passes under the fan in front of the motor and is carried back at the right side of the cylinder block to a connection at the base of the carburetor intake. This design directs the water about the fuel inlet, the lower part of the cylinders and valves when its temperature is the lowest. The radiation is increased by a fan that is mounted on a standard directly in front of the cylinder block and bolted to the engine case. This standard carries a ball bearing in an eccentric at its top in which the fan shaft revolves. This bearing and fan shaft may

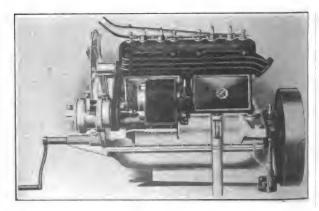
be adjusted to compensate for any slackening of the driving belt. The belt is driven by a pulley mounted on the magneto driving shaft and driven from the camshaft. The belt is large and should not be stretched nor affected by the ordinary conditions of service.

Force Feed Lubrication.

The lubrication is by positive force feed through a gear pump that is driven by a spiral gear from the camshaft at the rear of the engine case. This pump is mounted outside the case and is in every way accessible. The oil is supplied to the engine case through a filler at the left side and there is a sight float gauge that indicates the quantity of lubricant in the case. High and low marks are provided on the gauge and if the oil is maintained between these two levels, no smoke will emitted. The oil is drawn from a sump at the extreme rear of the engine base and is filtered before entering the pump. It is forced through a large pipe leading along the side of the case and through the hollow crankshaft to the main bearings and the connecting rod bearings. This supply is so plentiful and so positive that the big ends of the connecting rods do not sweep into the lubricant in the base of the case, there being sufficient oil distributed from them to lubricate the walls of the cylinders, the piston, the camshaft bearings, the cams and the valve pushrods, while a pocket at the forward end of the engine case is kept filled with oil. In this pocket the timing gear on the crankshaft revolves and supplies lubrication for all the gearing for driving the camshaft and the magneto and fan pulley shaft. Whatever excess of oil drains into the bottom of the engine case flows back to the filter and is again drawn into and forced through the pump. This system has been found to be most satisfactory and efficient under all conditions of use.

Ignition and Carburetion.

The ignition is with a Remy type S low-tension and a set of four dry cells as sources of current. The energy generated by the magneto is carried to and intensified by a Remy transformer coil located on the dash of the car and is returned to and is distributed from the magneto distributor. The current from the dry batteries is similarly intensified and distributed,



Right Side of the 30 Horsepower Cutting Motor.

this being generally for starting, but it is a dependable reserve should there be occasion to use it. The magneto is mounted on a bracket carried at the left side



of the engine case and is driven by an extension of the shaft that carries the fan driving pulley. The wiring leads from the magneto to the spark plugs and to the ground connection are short and stoutly made, that there may be no undue wear upon them. The spark plugs are located directly over the intake valves, where there is always certainty of an abundance of fuel and where the cool gas will minimize the temperature of the valves.

The carburetor is of the automatic float feed type with a water jacketed intake to the manifold that insures a uniformity of heating and a certain temperature of the gas as it is vaporized and drawn into the cylinders. This carburetor has been carefully developed and has been found to be efficient under all conditions of service. There is a straight lead through the intake into the cylinder block and a certainty that all the cylinders will receive the same proportion of fuel gas.

Clutch and Transmission.

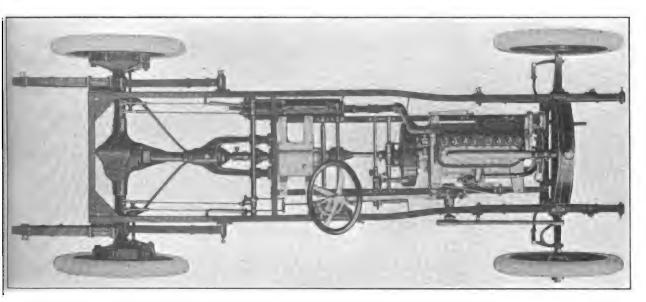
The oil pump shaft, the water pump shaft and

When the screws have been loosened the spider may be turned to create any desired condition. This construction is well illustrated.

The gearset is of the selective type, giving three speeds forward and reverse, with the main, or spline, shaft above and the countershaft below. The shafts are of 3.5 per cent. nickel steel and are hardened and ground. The gears are of the same metal and are heat treated to secure a high degree of endurance. The shafts are mounted in ball bearings of large size. In the 1911 model these bearings were phosphor bronze. The motor, clutch and transmission are installed in a substantial sub-frame that is carried inside the lines of and below the chassis frame. Between the transmission and the clutch is a universal joint to provide for the somewhat remote possibility of frame and sub-frame distortion, the joint being very large and substantial.

Driving Shaft and Rear Axle.

Securely fixed to the centre cross member of the frame are the ends of the yoke that form the forward



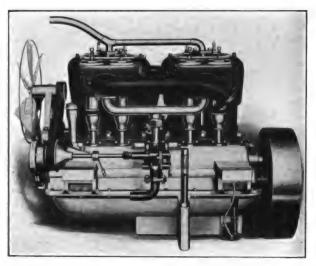
Top View of the Cutting Chassis for the A-30 and the T-35 Models,

the water pump are provided with grease cups for lubrication and there are oiler caps for the oiling of the fan shaft bearing, the magneto drive shaft and the magneto. The flywheel is of the solid web type, 16.75 inches diameter and 3.75-inch face. The web of the flywheel is practically flush with the forward edge, there being a recess on the rear side in which is installed the clutch. This clutch is driven without lubrication and is of the multiple disc form, there being seven cast iron discs, four fixed to the shaft between the engine and the transmission, and three carried fixed to the flywheel. On the clutch shaft is a collar and between this and the clutch is a heavy coiled spring. There are four sets of links and four dogs to obtain equalized pressure and as the discs are compressed the three fixed plates are clutched and the power transmitted. The adjustment of the clutch is very simple. The spider carrying the four dogs is split and threaded on to the clutch hub and it is retained by a large cap screw and a cap point set screw.

end of the housing of the drive shaft. Two brackets carry the ends of the yoke and between them is the universal joint to compensate for the variance in shaft inclination. In the forward end of the tube or housing is a Hyatt' high duty roller bearing and at the rear end of the shaft, directly in front of the driving pinion, is a New Departure double ball bearing that has high resistance to thrust as well as radial service. From the tube, back of the yoke, the torsion rods extend to the rear axle housing. The torsion tube is bolted to the rear axle shell and it has a small inspection plate so that the ball bearing and the drive pinion may be examined when desired.

The rear axle is of the semi-floating type with a housing of malleable cast steel. The bearings are all high duty Hyatt roller construction and are of large size. The bevel pinion and bevel gears are of 3.5 per cent. nickel steel with five pitch and 1.312-inch face, there being 15 and 53 teeth respectively. The gear ratio is 3.5 to one. Axle shafts are of 3.5 per cent.

nickel steel and the construction is such that the axles may be drawn out through the ends of the axle housing when the wheels have been removed. The differ-



Exhaust Side of the Model T-55 Cutting Motor.

ential may then be taken out by removing the cover plate of the axle shell. The axle shafts are 1.37 inches' diameter. The spring saddles and the brake brackets are especially well proportioned and exceedingly durable.

Chassis Frame, Springs and Wheels.

The chassis frame is of pressed steel channel section, 1.5 inches deep and 4.125 inches wide. The frame has three cross members and it is strongly braced by gusset plates. The sub-frame, carrying the motor, clutch and transmission, is mounted on the first and middle members. The frame is slightly cambered forward of the dash, which affords a wider wheel lock and consequently greater ease in turning in a narrow way. The forward suspension is on semielliptic springs two inches wide and 38 inches in length, of six leaves, and at the rear the frame is carried on three-quarter elliptic springs two inches wide and 50 inches in length, of seven leaves, this affording a most luxurious and satisfactory conveyance. The forward axle is an I beam section that is drop forged with the spring seats integral, the yokes being unusually large and strong. The steering knuckles are long and substantial and the wheel spindles are of ample diameter. The wheels are mounted with ball bearings. The tiebar is installed behind the axle for protection against road obstructions.

The wheel equipment is of the 12-spoke artillery type, of second growth hickory, with quick detachable rims and fitted with 34x4-inch tires. Spokes are 1.75 inches in diameter. The wheelbase is 116 inches.

Control Wheel, Pedals and Levers.

The control of the car is from an 18-inch notched steering wheel mounted on a column of pronounced rake and by means of a worm and gear of 40 point carbon steel that is hardened to give greater endurance. The spider of the steering wheel is aluminum and the rim of black walnut. The carburetor throttle and the magneto spark are controlled by levers on a sector mounted above the steering wheel. The steer-

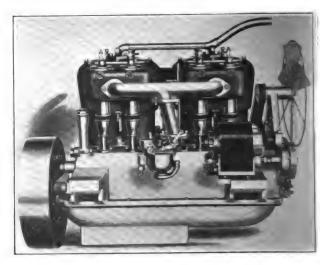
ing column is mounted in a heavy brass fitting located forward under the cowl of the dash. The left pedal operates the clutch and the right actuates the service brake. This is a change from the 1911 car in which both clutch and service brake were operated by the same pedal. The service brake is external contracting on drums 14 inches diameter and two inches wide on the rear wheels, and the emergency brake has internal shoes 13.75 inches diameter and two inches wide expanding within the drums on the rear wheels. Both brakes are Raybestos lined and are double acting, so they will hold in either direction. The brakes are fitted with equalizing links that they may operate uniformly at all times. The emergency brake is applied and the changes of speed are made by levers inside the car at the right of the driver. There is a foot accelerator and a cut-out valve operated by pedal, the former at the right and the latter at the left of the driver and convenient of operation.

Torpedo Roadster Body.

Model A-30 is fitted with a torpedo roadster body with long hood and cowl dash and distinctive side doors. The seat is deep and roomy and luxuriantly upholstered and is unusually comfortable. The fenders are long and high and sweeping, with a typical roadster running board. The dash lamps are carried low and well forward, being visible from the front between the hood and the fenders. The gasoline tank, which has capacity of 20 gallons, is located back of the body and is high above the carburetor.

Model T-35 Has Sightly Torpedo Body.

The body of model T-35 is a straight line design with fore doors and a cowl dash, being of the type that has become known as torpedo. The running board is wide and good length is obtained by carrying it back close to the rear wheels. The fenders are long and ample, there being a very pleasing effect obtained by the sweep of the front guard. Between the running board and the body there is a splash apron that is sightly and harmonizes the entire assembly.



Intake Side of Model T-55 Cutting Motor.

The dash lamps are carried in practically the same position as are those of the A-30. The fuel capacity of this car is 15 gallons. The upholstery is of fine

leather and curled hair over springs, making satisfying cushions for the seats and backs.

Model T-55 50 Horsepower Motor.

Model T-55 has practically the same chassis dimensions as has that just described, except that the frame is 18 inches longer, the rear axle is of the full floating type, and the engine is larger and has higher

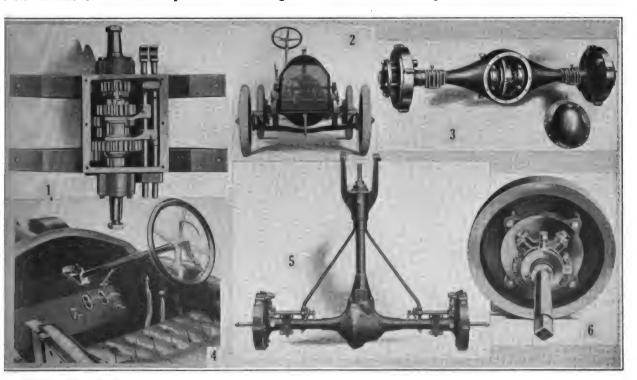
The engine is rated at 50 horsepower and its design is different in many ways, though it has certain of the characteristics of the smaller motor. The cylinders are of the T type and are cast in pairs with the water jackets integral. The material is a superior quality of gray iron and in the designing care has een taken to insure adequate radiation. The bore of the cylinders is 4.75 inches and the stroke 5.50, hese dimensions yielding the full rating of the motor inder normal conditions of operation. The engine

four bolts that extend through the metal of the case.

The pistons are of the same quality of metal as the cylinders and are turned and ground to size. For the purpose of minimizing the side thrust the pistons are six inches length, a half inch more than the stroke. The pistons are fitted with four rings, each a quarter inch width, ground to an accurate fit. The pistons also have three oil grooves to positively lubricate the walls of the cylinders and piston pin bearings.

Valves and Valve Mechanism.

The intake valves are at the right side of the motor and the exhaust valves at the left, there being two camshafts. The camshafts are .937 inch diameter and also have three bearings. Both camshafts and the crankshafts have journals of Parsons' white bronze. The cylinders are offset .75 inch with relation to the crankshaft, this making for a minimum of side thrust from the piston and an increased efficiency.



The Cutting Transmission, 2--The Cutting Model A-30

se is of aluminum and it is cast in halves, the lower rming the reservoir for the lubricant and the upper rrying the crankshaft, camshafts and oil pump. The ar section of the bottom half forms the sump or coniner for the oil. The engine base is exceedingly nooth and well designed. In its assembly not a bolt stud has anchorage in the aluminum, every rening bolt being entirely through the metal, making certain there will be no wear from vibration.

Crankshaft and Pistons.

The crankshaft is two inches diameter, which is tremely large when it is understood that it is cared in three plain journals. The shaft is of nickel eel and is carefully machined and ground to size. ne main bearings are of liberal size, being 3.5 inches length. The bearing caps are each retained by

Chassis Head-On, Showing Small Resistance of the Radiator. 3—Rear Axie of the Cutting T-55 Chassis. 4—T he Simplicity of the Cutting Wheel Lever and Pedal Control. 5—The Rear Axie and Shaft Assembly of the Cu tting A-30 Chassis. 6—The Cutting Dry Disc Clutch.

> The connecting rods are 11 inches in length and the. big ends have bearings 3.5 inches in length at the crankshaft. The wristpins are of case hardened steel 1.19 inches diameter and the bearings are 2.875 inches length, this being a very substantial construction.

The engine case lower section may, without difficulty, be removed for work upon the crankshaft, camshafts the bearings or the timing gears. The removal can be made without disturbing the mechanism in any manner.

The valves are actuated from the camshaft through pushrods that are practically enclosed in circular housings which also enclose the valve stems and guides. This design effectually protects these working parts against dust, water and contact with any object. The valves are of nickel-steel heads with steel stems electrically welded. The valves are 2.25 inches diameter and the ports are two inches diameter, this construction making certain positive clearing of the cylinders at the close of the exhaust stroke and sufficient charges of gas with every aspiration stroke. The valves are interchangeable. The tappets are held in contact with the cams by small springs and the cams are so ground that the noise of the motion is minimized. The intake valves are kept cool by the fresh charges of gas drawn into the cylinders.

Force Feed Oiling System.

The method of lubrication is practically the same as has been described for the smaller model, there being the same positive means of distribution of the oil to all of the bearings and moving parts within the engine assembly. The means is a gear pump driven by a spiral gearing off the left camshaft. There is also the same float sight gauge to indicate the quantity of lubricant in the engine base, this being close to the pump on the same side. The oil is supplied the engine on the right side, back of the last cylinder.

The Radiation System. The motor is cooled by water and a cellular radiator of abundant proportions of the honeycomb type, the water being circulated by a centrifugal pump. This pump is driven by an extension of the shaft that drives the fan driving pulley and it is located at the left side between the cylinder units. The water is drawn from the radiator and forced into the water jackets at the bases of and between the exhaust valves, this giving the cooling effect where it is most needed. The water is forced to the radiator through a manifold from the centre of each cylinder group head, there being large piping with easy curves to avert possibility of obstruction. The radiation is increased by a large fan that is mounted on a standard set on the engine case forward of the first cylinder. This bracket is fitted with a ball bearing in an eccentric by which adjustment may be made when necessary to tighten the fan driving belt. The operation of adjusting the belt may be performed quickly and with certainty. left camshaft gear drives the fan belt pulley and its extension is coupled to the shaft of the water pump.

Ignition and Carburction. The right camshaft drives the driving gear of the Remy type S low-tension magneto by which current for the ignition system is supplied. This system is identical with that used in the A-30 with the exception that instead of a battery of dry cells a 60-ampere storage wet battery is employed. Under ordinary conditions the magneto is used, the storage battery being utilized for starting and for the electric side and tail The magneto is located on a bracket at the right forward end of the motor and the leads of the wiring are short and to a fiber tube on the water outlet manifold, where it is retained by lugs. od of installation effectually prevents damage from contact with the engine and from saturation of the cable by oil or water.

The carburetor is of the float feed type and is automatic in action, having an efficiency that is well established. The form of the intake manifold is such as to insure a uniform supply of gas to all the cylinders. The fuel capacity is 15 gallons and the gasoline is supplied to the carburetor by pressure.

Clutch, Transmission and Driving Shafts.

The flywheel is 17.75 inches diameter and 4.5 inches base. In this is installed the clutch, which is

of the same type as is used in the A-30 chassis. The transmission is also the same as is in the A-30.

The driving shaft is of the double universal joint type and it is not housed. The relation of the real axle is maintained by radius rods. The rear axle is of the full floating construction, it being contained in a pressed steel housing. The differential gears are of the same size as those in the A-30 axle and are of 3.5 per cent. nickel steel. These gears may be taken from the shell if desired. The driving axles are 1.37 inches diameter and are 3.5 per cent. nickel steel. These shafts may be withdrawn from the axle housing should occasion require. The axle shafts are carried on New Departure ball bearings throughout. The front axle is the same as for the A-30 chassis.

Chassis Frame, Springs, Wheels, Control.

The chassis frame and sub-frame are similar in material and construction and are mounted on semielliptic springs forward and three-quarters elliptic springs at the rear of the same sizes. The wheels are the wood artillery type with 12 spokes and are equipped with demountable rims and 36x4-inch tires.

The control of the car, the steering wheel, spark and throttle levers, clutch and service brake pedals, foot accelerator, cut-out, emergency brake lever and speed changing are the same as for the T-35 machine.

The body of model T-55 is also of the same general design as that of model T-35, but is 14 inches longer, the wheelbase of the T-55 being 126 inches. This permits the installation of a very roomy tonneau and makes this model exceedingly handsome and rakish in appearance.

The model F-60, the seven-passenger Cutting car, is practically unchanged. This machine has a 50 horsepower motor and a four-speed transmission, with wheelbase of 124 inches. Its tire equipment has been increased from 36x4 inches, demountable, to 37x4.5 inches demountable.

With all of the Cutting cars the lamps and the metal fittings are finished with nickel and black enamel instead of brass.

Cutting cars have such long wheelbases and large motors that the maker claims exceptional value is represented in all 1912 machines. To better establish the basis for such contention a table has been prepared, in which is shown the cost of Cutting cars per horsepower and per wheelbase inch in comparison with more than 50 different makes of market prices approximately at parity. This table is sent to all who request a copy.

UTICA DEALERS ORGANIZE.

The dealers in Utica, N. Y., have organized the Utica Auto Trades Association with the following officers: President, H. D. Gouse; vice president, A. A. Ledermann; secretary, W. F. Carroll; treasurer, A. H. Westcott. The following firms are represented in the membership: Crist Motor Car Company, Utica Motor Car Company, Ebann & Berringer, Lederman Company, Bailey & Bowne, Ford Sales Company, Westcott Garage Company, Decker Garage Company, CrimBronner, Oneida Square Garage Company, H. A. House, Central Auto Supply Company, Utica Cycle Company and Utica Auto Supply Company.







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Students of aviation are somewhat surprised to note the remarkable development in the matter of construction exemplified by the exhibits at the fourth international salon in the Grand Palais, Paris, France. Of course, Americans are compelled to base their opinions upon the reports which have reached this side, but in nearly every instance these indicate that the progress displayed by Continental constructors is decidedly worthy of note. In some respects there may be question as to the practicability of certain innovations, particularly at this early period in the development of the science, but as a whole there seems to have been a well defined attempt at solving some of the more important problems.

While it was natural to expect that the show would reveal considerable in the way of speed creations, largely because of the new records made in this field during the past year, it is a source of much pleasure to note that determined effort has been made toward stability and safety. These are details which are hard to detect unless the whole machine be gone over with a critical eye. However, the opinion of inventors who saw the display is unanimous in declaring that wonderful progress has been made along these lines. The modern aeroplane, if the term may be thus applied, is decidedly more trustworthy than were the machines of even a year ago.

It is undoubtedly questionable whether or not the time has arrived when it is feasible to construct aeroplanes with enclosed bodies. L. Bleriot had on display the new Bleriot monoplane limousine, built to special order for M. Deutsch, and this safely may be placed in the innovation list. It is significant though that the contracts for military aeroplanes now being ordered by foreign governments include paragraphs specifying such items as comfortable seats, cases in which to carry tools and a variety of spare parts, means of accommodating compass and maps, and the installation of wireless telegraph outfits. Evidently, these have reached a point where they are to be considered both practical and necessary equipment. Some of these things seem decidedly pretentious from an American viewpoint.

Perhaps the United States is not taking aviation seriously enough, as has been intimated in no uncertain terms by foreigners who have been invited to speak upon the subject in this country. Certain it is that those who have given thought to the reports concerning the recent salon will be convinced that in France, at least, the aeroplane occupies a position closely analogous to the automobile. Statements relative to 1912 and 1913 models, sound very much like those made concerning motor cars, but European con-

structors go much further, giving specifications and details of equipment, tabulated every bit as concisely as in the manufacture of automobiles.

A year ago, an order for two machines was considered a large contract, although makers in France, England and other countries abroad have been building in series for considerably more than a year. Nowadays, it is no uncommon thing to receive orders for 10 or 12 machines at a time, and it is stated authoritatively that some manufacturers will do a business aggregating at least \$1,000,000 during the 1912 season. This situation is hardly conceivable on this side, but the importance of the salon is better understood in the light of this information.

Not all of these machines are being utilized by aviators for exhibition purposes, since Europe found months ago that flying exhibitions do not pay. The news of aviation which reaches America would seem to indicate that none but professional aviators were flying, and that for some prize or other. But this is not true, either. Many machines are used by governments in army and naval experimentation, and some in actual warfare, but all of these combined are not sufficient to warrant a prediction of a business aggregating \$1,000,000 by one concern. It follows that aviation has become somewhat popularized on the Continent.

Prices may have a bearing upon the subject, and it is interesting to note that some of the machines on display were offered to the public for as low as \$1560, fully equipped. These included the Gaudron biplane, fitted with 35 horsepower Anzani motor, while one of the Bleriot monoplanes, designated the Popular type, is listed at a little less than \$2300. This also has an Anzani motor and is fully equipped, an up-to-date 1912 model. A Deperdussin for \$2250 and a Voisin for \$2150 are other machines in the so-called low price class.

With special reference to the individual exhibits: Louis Bleriot had on display four models of the Bleriot monoplane, not counting the limousine previously mentioned. These were: The 70 horsepower two-seater, the 50 horsepower cross country model, a new 50 horsepower racer and the Popular type of 35 horsepower. In some respects, the new racing model presented features of design and neatness in construction well in advance of other machines on display.

The fuselage, which is tapered toward the front to reduce head resistance, is splayed out at the rear, after the manner of the better known 70 horsepower model, to form a flat stabilizing tail. The elevator is semi-elliptical in shape and is hinged to the rear of the tail surface. Contrary to the usual Bleriot practise, the

engine, a 50 horsepower revolving Gnome, is not supported on both sides of its crankcase, but protrudes from the front of the fuselage. A new type of landing chassis is used, this consisting of two wheels, each supported by a pair of laminated steel springs, and only four struts are employed in fastening this to the fuselage. Wing warping is accomplished by a neat system of chains and chain wheels. The new machine is said to have developed a speed of 80 miles an hour with Alfred LeBlanc at the wheel, and is expected to vie with the Nieuport in securing speed records during the coming season.

In the so-called Popular model, special attention has been paid to the comfort of the operator. The forward end of the fuselage is completely covered, thereby insuring that oil from the engine will not be spattered over the occupants. A portion of the floor-

ing upward deflection of the other. The undercarriage, which was one of the chief features of the biplane, has undergone slight modifications, in that the usual two pairs of swivelling wheels have been replaced by one pair of wheels, joined by a common axle flexibly sprung from the skids by conventional elastic straps.

Much interest attached to the diminutive Caudron biplane by reason of its size and the simplicity of its construction. A certain amount of automatic stability in a lateral sense is obtained by the design of the main planes. The rear boom is only two feet behind the leading edge, and the remainder extends backward from this point two feet six inches, being formed by the application of a single surface of fabric over flexible continuations of the ribs. Landing carriage and tail outriggers are combined and the



Interior of the Grand Palais, Paris, France, During the Progress of the Fourth International Aerial Craft Salon.

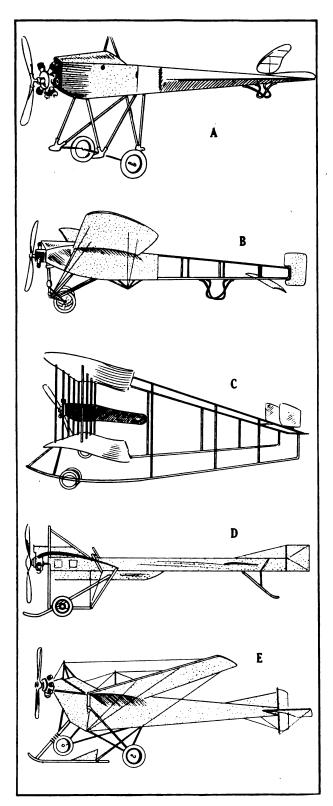
boards at the front of the cockpit is left uncovered, enabling the pilot to obtain a clear view of the ground beneath him. The landing carriage is fitted to the bottom of the fuselage, not only diminishing weight and head resistance, but reducing the overall length of the machine something like seven feet.

The Farman Freres exhibited but two models; an Henri Farman two-seated monoplane and a Maurice Farman biplane. The latter is not new, the only change noted being a staggering of the main planes and reduced dimensions throughout.

The Henri Farman monoplane maintains some of the characteristics of the biplane by the same constructor, particularly with reference to the use of ailerons, although these are interconnected, so that the downward deflection of one causes a correspond-

body provides for the pilot's seat midway between the main planes, at the forward extremity of which is the engine mounting. A single monoplane surface performs duty as stabilizer and elevator, the latter function being accomplished by flexing the rear portion. Steering is by two vertical rudders, working in parallel.

Four types of monoplanes were shown by the Deperdussin firm, these being: The 100 horsepower Gnome-engined three-seated model, 50 horsepower single-seated cross country type, 35 horsepower Anzani-motored popular and 70 horsepower military. The military machine was the only new creation, but its sole difference lies in the fact that passenger and pilot are located tandem fashion in the fuselage in such manner that the former is so far forward he can



A Few of the New Machines Shown at the Salon: A, Bleriot Racing Type; B, Bleriot Popular Model; C, Diminutive Caudron Biplane; D, Deperdussin Racer; E, Latest Design of R. E. P. Monoplane.

obtain an excellent view of what is transpiring under the machine by looking over the edge of the wings.

Two machines were shown at the R. E. P. stand. One of these was covered with red fabric and made a decidedly attractive exhibit, while the other was a simple fuselage completely denuded of fabric to show the excellence of the interior workmanship. The only change in these machines is in the motor, which has seven cylinders arranged radially around the crankcase and is rated at 90 horsepower.

Roger Sommer was represented by two machines, a monoplane and a biplane, the latter being constructed throughout of steel. This really should be termed a double monoplane, as the cellular method of bracing the main planes has disappeared in favor of the system originated by Breguet. Balancing laterally is effected by the rotation of the extensions of the top plane around the front spar. The surfacing is a leaf green in color, for the purpose of making the machine less visible when flying near the ground.

One of the two types of Vinet machines on display might be termed a modified Bleriot, while the other was distinctly different. This also is a monoplane, the body of which is constructed on the box girder principle and is completely covered with fabric. The landing chassis is characteristic of extreme simplicity, consisting merely of a pair of skids proceeding forward from the fuselage to a pair of wheels mounted on a common axle attached thereto by means of channel steel outriggers and rubber straps. Arranged above the pilot on a superstructure of wood cross-braced with steel wires are the motor and wings.

The Voisin Freres displayed the canard type machine, which appears to be the French term for hydroaeroplane. There is nothing particularly new concerning this biplane construction, with the exception that it has been given a number of satisfactory tests during recent military trials at Rheims and is fitted with pontoons for alighting on and arising from the water.

The Astra three-seated tractor biplane was the nearest approach to an American machine in the salon. As is well known the Astra is made under license from the Wright brothers, although about the only resemblance it has to the biplane of that make is in the matter of wing warping and the correction of lateral stability. The engine is a six-cylinder Cenu, rated at 100 horsepower, and this drives an eightfoot Astra tractor screw through reduction gearing. Radiators for cooling the motor are disposed on either side about opposite the middle seat.

Great Britain was represented by the two-seated Bristol monoplane, which differs but slightly from those which have been seen in other displays, with the single exception of its size. Passenger and pilot are arranged tandem, being located approximately over the centre of pressure. The landing carriage has been improved by extending the skids some three feet in a backward direction, which is expected to dispense with the necessity for a tail skid.

The Bronislawski method of balancing was shown on a Henri Farman biplane. This system comprises a pair of cambered planes set at a positive angle of incidence and rigidly mounted to a vertical mast, which is supported from the main planes by a skeleton of steel tubing. One of these devices is located at each end of the main planes. In normal flight they

are arranged in end-on aspect to the relative wind, but as soon as the machine is tilted out of the horizontal in a lateral sense these planes are rotated about their vertical axes by means of wires passing from the pilot's control lever to a drum attached to the bases of their respective masts. By this action they become incident to the relative wind and thus lift or depress according to whether their incidence is positive or negative. As one of the most important features of this system, the inventors claim that in the action of restoring balance the position of the centre of resistance on the machine as a whole is not altered, so that there is no necessity for bringing the vertical rudder into play, and that the Wright patents are not infringed.

Breguet displayed three models, two of which were military biplanes of standard design. The third may be described best as an aerial torpedo touring car, of which the carriage and side entrances were constructed by the well known automobile body builder, Labourdette.

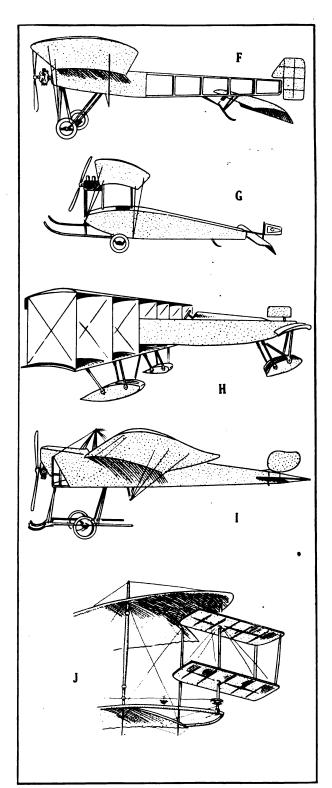
The Savary military biplane has two propellers, like the Wright, but unlike the American machine, these are placed in front of the main planes.

Among the other models shown was the new aerial torpedo by Paulhan and Tatin, which has been described in more or less detail and illustrated in The Automobile Journal.

The first record of 1912 is reported from France, Jules Vendrines having flown about 88.25 miles in one hour at Pau, Jan. 13. The previous record was held by the late Edouard Nieuport in a Nieuport monoplane at 82.7 miles. The dispatches from abroad fail to state the make of machine utilized by Vendrines, but he has been flying a Deperdussin monoplane in recent military events, and it is presumed he used one of these in setting the new mark.

It would appear that James V. Martin and Harry N. Atwood are very much in earnest concerning their announced intention of attempting to cross the Atlantic ocean by aeroplane during 1912. Martin is said to have completed arrangements with the Aero Club of Great Britain, from which he secured his pilot's license, while Atwood is to be backed by a Boston firm, the Clayton-Craig Company. Both aviators are at work on specially designed machines, the construction of which is to be maintained a strict secret until the time of starting. The event is to be much in the nature of a race, inasmuch as neither aviator is working in conjunction with the other. Atwood's machine, it is understood, will be equipped with two motors, while Martin is to utilize a hydro-aeroplane.

Glenn H. Curtiss gave his new flying boat an official trial at San Diego, Cal., Jan. 10, making a speed of 50 miles an hour in the water and 60 miles in the air. The new craft is not a hydro-aeroplane in the strict sense of the word, being a boat 20 feet in length and tapering to a point at either end, to which has been attached a modified form of Curtiss biplane. Complete details have not been made public as yet, but it is expected that they will be so soon as the new machine has demonstrated its possibilities to the complete satisfaction of the inventor.



Other Features of Salon Display: F, 50 Horsepower Sommer Monoplane; G, Simplified Type of Vinet; H. Volsin Canard; I, Bristol Two-Seater of British Mal J, Bronislawski Stabiliser.



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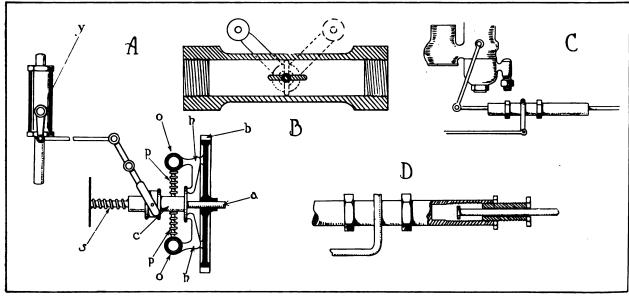


Governor for Motor.

ernor that will take care of a variable load of from three to 10 horsepower when the car is standing still without having the motor race. Will I have to disconnect hand throttle connections to the carburetor when the governor is in operation? Westboro, Mass., Jan. 11. C. A. MAYNARD.

The usual system of governing is by reducing the amount of vapor to the motor; that is, obstructing the This may be accomplished by fitting a butterfly valve or a rotating plug valve in the pipe,

The spring s is so adjusted as to hold the sleeve c agains the arms h h until the engine reaches a certain number of revolutions, while, by means of an accelerator in the form of a hand or foot lever the spring s can be assisted to hold back the sleeve c. When this sleeve is held against the arms, the governor does not come into action, and the throttle remains fully open. When the motor is started, the gear wheel b, and with it the weights o o revolve, and centrifugal force tends to cause the latter to fly outward, a tendency which is resisted by the spring p. As the number of revolutions of the engine increases, the centrifugal force overcomes the resistance of the spring p, the weights fly out, and the arms press against the sleeve c. A



Installing a Governor: A, Method of Incorporating Valve in Inlet Pipe; B, Construction of Butterfly Valve; C, Con nections to Carburetor; D, Adjustable Rod Device,

this being actuated directly from the governor. In the accompanying illustration is shown a centrifugal governor and two methods of application.

At A is depicted the system for reducing or cutting off the supply of fuel to the motor. In this a is the half-time or two-to-one shaft of the engine, and mounted upon it is the gear wheel b, which consequently revolves with it. The governing weights o o are attached to the wheel by arms which move freely on studs, and the former have continuations h h at right angles. The ends of the arms bear against the sleeve c, which slides freely upon the shaft a when pressure is applied, but which is normally pushed against the arms h h, by the spring s. A spring p connects the weights, and tends to draw these toward each other. In the chamber or pipe y is a butterfly throttle valve which governs the admission of mixture to the combustion chamber, and the object of the governor is to control this valve which is accomplished as follows:

further increase of speed creates additional centrifugal force which, at a certain point, overcomes the resistance of the spring, the sleeve c moves along the shaft a, and the throttle begins to close, reducing the charge to the cylinders. This has the effect of slowing the engine, and the throttle opens again, either partially or wholly, according to the movement of the accelerator.

The drawing shows the general principle on which the centrifugal force is conveyed from the governing weights to the throttle valve. The arms push the sleeve c, the latter actuates the fork on a rod which is pivoted. Another rod is connected with the throttle lever which operates the valve inside. At B is presented the butterfly throttle valve, the dotted lines depicting the valve closed and the relative position of the actuating lever.

A method of utilizing the governor with the rod leading from the latter attached to the throttle of the carburetor is illustrated at C. Here the rod leading from the hand throttle is equipped with a forked member, fitting over another rod which is threaded to take two nuts, these being for the purpose of adjusting the lead and retaining the fork. This is shown at D which sketch also illustrates the method of fitting the rod leading from the governor. The former is held by a threaded adjustable member through which it moves freely.

When the governor is in action the rod attached to it moves until the headed portion makes contact with the threaded member and a further movement of the sleeve on the governor actuates both rods and closes the throttle. The latter is fitted with a spring for the purpose of opening when the speed of the motor decreases and the sleeve of the governor returns to normal position. The fork attached to the hand throttle permits of regulating the opening of the carburetor in the usual manner. The action of the governor rod may be regulated by the threaded member by lengthening or shortening as the case requires. The nuts, one either side of the forked member, permit adjustment of the hand throttle.

Regarding the use of the governor, it may be stated that it has been discarded by makers of pleasure vehicles but is applied in various forms to stationary engines where the load varies.

Full Floating Rear Axle.

(1328)—Kindly answer through your columns if there is more power delivered to the rear wheels of an automobile through the full floating rear axle than through the semi-floating type. I have heard many comments on this subject, some claiming that the full floating axle takes off considerable friction and results in more power at the driving wheels.

C. H. S.

Bridgeport, Conn., Jan. 13.

With the full floating type there is slightly less friction and consequently more energy is delivered to the driving wheels. The difference is very small, however. Both the semi and full floating designs are utilized by leading manufacturers of motor cars.

Motor Knocks.

(1329)—I am having trouble with my —— motor. I cannot open the throttle wide without getting a knock although the spark may be well retarded. With a slight opening of the throttle I can advance the spark to its utmost without the engine knocking. The timing gears have been removed once by an expert from the factory. Can you not locate the trouble for me?

N. H. HARRISON.

Macon, Miss., Jan. 8.

It may be possible that the car is being operated with too rich a mixture and this may be determined by noting the odor of the exhaust as it leaves the muffler. If the mixture be correct it will be well to check the ignition timing and note the position of the piston. It is possible that in replacing the gears the factory expert may have set them a trifle too early.

The position of the piston may be checked by inserting a rod or bicycle spoke through the opening of the priming cock, and with the switch off, turning the motor until the cylinder is compressing. A further movement of the starting crank will cause the rod to rise and when the latter stops, it will denote the top of the stroke or dead centre.

When the switch is thrown on the coil should buzz and a spark be noted at the gap of plug if the motor be timed at dead centre. The operation may be facilitated by removing a plug and placing it on the top of the cylinder as in testing a plug.

When a spark does not materialize, the motor should be turned slightly so as to start the piston down on the firing stroke. It should be moved but little and at the same time it should be noted whether a spark appears at the plug. If timed correctly one should be seen when the piston has begun its downward movement.

If not, the piston should be brought back to dead centre again and the motor turned so that the flywheel moves in the direction opposite to that in operation. By moving the member slowly until the piston has begun to descend, if the timing be early it will be indicated by a spark at the plug. If this condition exists it should be corrected. With the spark lever fully retarded the spark should occur when the piston begins its downward movement or firing stroke. The amount of this lead varies according to the design of the motor, etc., but the writer favors about .5 inch which provides a safe lead for cranking and this retard can be taken care of by the advance of the spark lever

Pressure of Compression,

(1330)—Please instruct me as to the pressure of compression of a 5.5-inch bore and 5.75-inch stroke opposed engine at say 45 revolutions. Please send rule for figuring pressure if it is convenient. W. R. HIGGINS. Mott, N. D., Jan. 17.

The pressure at a speed of 45 revolutions under normal conditions would be about 70 pounds. In the case of higher speed, an addition of from 15 to 20 per cent. may be made as it is expected that some loss of compression will be caused by the piston rings at slower speed. The rule for figuring pressure is as follows: Find ratio of combustion chamber to cylinder capacity. Ordinarily this is one to five. Then multiply the atmospheric pressure 14.7 by the ratio 5 which gives absolute pressure. If the gauge pressure be desired, deduct from the product 14.7.

IMPROVEMENTS NOTED IN DAY CAR.

A number of distinct improvements mark the 1912 model of the Day utility car, manufactured by the Day Automobile Company, Detroit. One of the difficulties in constructing a machine of this type has been to secure a design that was of high class as a touring automobile and at the same time could be converted readily into a practical commercial wagon.

Thomas W. Day, designer of the Day car, has solved the problem and his product has the straight line body effect, fore doors, inside handles and control. By touching a spring and removing the rear seat and doors the vehicle is transformed into a delivery wagon of 800 to 1000 pounds capacity.

Among the improvements are: A larger and more efficient motor, rated at 32 horsepower; 34 by 3.5 or four-inch tires, longer body and central control. It is said that in its touring form it cannot be distinguished from the ordinary motor car of the same type. The rear seat is held in place by eccentric locks and the construction of the carrying receptacle is such that it is difficult to note its removable features.



CURING SPRING SQUEAKS.

Occasionally the repairman will be called upon to locate a mysterious squeak or rattle in a car which has puzzled the owner, and an instance of this was noted recently. The motorist complained that the noise was only discernible when the machine was travelling over rough roads and that the rattle seemed to be in the front of the car.

The ball and socket joints of the crossrod and those of the tierod and steering gear were examined

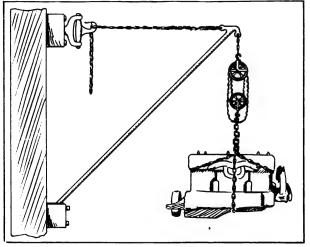


Fig. 1—Adjustable Swinging Hoist, the Material for Which Was Mostly Scrapped Parts.

but the play in these members was too slight to cause the trouble. Finally one of the workmen began to pull the goose necks up and down, simulating the action of the car in passing over rough roads.

It was discovered that the noise was caused by the side play between the ends of the goose necks and those of the springs, this condition being due to the wear of these parts. When the car was traversing rough roads the axle rarely was parallel with the machine in front elevation, as at one moment the left side was higher than the right and vice versa. This caused the ends of the springs to strike the lugs of

the goose necks. The pins were removed and a washer fitted eliminating the noise.

ADJUSTABLE SWINGING CRANE.

Many small shops are not equipped with any form of a hoisting device for lifting the motor or heavy parts from the chassis when overhauling the automobile. Under such conditions the general practise is to strip the engine, part by part, until but the crankshaft and flywheel remain for removal. In some garages but one repairman is retained during the quiet months of the winter and frequently he has to call for assistance in disassembling the car.

A workman in one of these small shops made an adjustable swinging hoist which is depicted at Fig. 1, and the material used, with the exception of the chain eyes and pulley was taken from the scrap heap. The latter furnished a part of an old I beam section axle with the spindle bolt and bushing worn badly. The axle was cut to a suitable length, and a new bushing fitted to the spindle. It was then placed in a lathe and the arm turned down after which it was heated and bent in the form of a hook, as depicted at Fig. 2 A.

A wooden block was next procured, a hole cut to fit the axle and a strip of metal screwed on as shown at C to form a support to the axle. Four holes were next bored for the coach screws. Two more blocks were cut out and marked, holes corresponding to the others being bored. These were attached to the post by the screws as outlined at A.

A small block was then made to fit between the upper and lower horizontal members and marked from the outside to provide an opening that would register with the vertical block. Metal strips were attached, as shown at B, these being for the purpose of providing a bearing for the axle and the retaining pin.

The axle was then passed through the opening in the vertical blocks and measured for the pin. After a hole had been drilled in the axle and the pin fitted, and the part replaced, the key was driven as shown in the sketch.

The lower support of the crane was made from a block of wood into which was set a ball socket E, the opening of which was enlarged slightly. The ball D was turned from a piece of stock, and enough shank left on the metal to fit into a piece of heavy tubing and advive fit made. It was secured by drilling and riveting in two pins.

The piece with the eyes for attaching chain was made by a blacksmith and afterwards turned down and fitted to the pipe in the same manner as the ball member. The plates F were made to fit over the ball tocket E after the latter had been placed in the block which was screwed to the post.

A suitable chain was utilized to connect the swingmg spindle and crane, and the ball and socket bearing
permitted this to be lengthened or shortened as destred. A two-sheave chain hoist of the Weston differential type was procured and attached as shown at
Fig. 1. This enabled the operator to sustain the load
m any position.

The device was attached to a post convenient to the work bench and its arrangement allowed it to be worked over 200 degrees. With it a motor could be lifted from the chassis and swung to any position

LINING UP CRANK AND GEARSHAFTS.

If the crankshaft and gearshaft of a motor be suspected of being out of alignment these parts may be tested without dismantling either the engine or the gearbox. If the clutch be of the leather faced cone type it should be examined to note if the cone engages evenly with the flywheel member. If not it may be assumed that the engine and gearbox are not aligned. If on turning the flywheel with the clutch held stationary, the former is inclined to wobble, then the crankshaft is out of line. When the flywheel is held and the clutch revolved the latter shows a tendency to oscillate, then the clutch or gearshaft is out of true. If both shafts be true and the clutch does not engage properly, then the motor or gearbox is out of line.

By attaching a pointer to the clutch coupling so that it will just touch the outside edge of the flywheel, the gear and crankshaft may be tested for alignment without having to dismount the clutch, but if the two

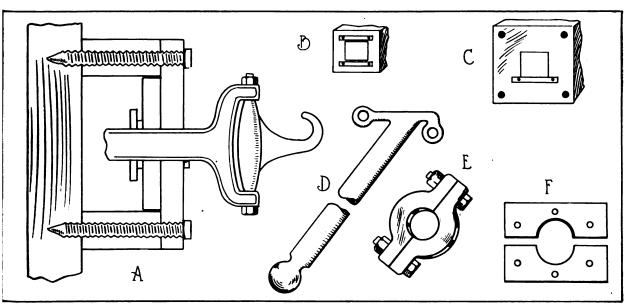


Fig. 2—Parts of the Hoisting Device: A, Depicting Method of Attaching Spindle to Post; B and C, Wooden Blocks Utilized to Secure Spindle; D, Upper and Lower Ends of Arm; E, Bearing for Ball End; F, Retaining Plates for Ball Member,

within this radius, and lowered to the bench or to a stand. When not in use it was folded up and hooked sgainst the post.

The device could be simplified by using a substantal hook in place of the spindle, while an eye bolt build be substituted for the block and the lower end of the crane made to fit.

ATTACHING LEATHER TO IRON.

Leather may be fastened to iron by painting the metal with a mixture of white lead and lampblack dissolved in oil. A cement is then made of the best glue waked in water until soft, and then dissolved in vinegar. This is mixed thoroughly with one-third its bulk of white pine turpentine, and thinned with vinegar until it can be spread with a brush. It should be applied to the metal while it is hot, and the leather put on and pressed quickly into place. It should be held tight by a clamp while drying.

shafts require lining up it is advisable to remove the clutch.

When the pointer makes contact with any point of the periphery on the wheel, then the two shafts are in line. If the clutch be removed the pointer may be used on the inside of the wheel. Where fanblades are fitted to the rim of the flywheel this will be necessary. Care should be taken to note if the bushing of the clutchshaft is not worn as this condition will lead one to surmise that the clutch is out of line.

CLAMPING WORK TO FACE PLATE.

With some work it is necessary to bolt or clamp a piece to the face plate, and many times it is difficult to keep the piece from slipping, especially it if become necessary to take a heavy chip in turning or boring. A piece of thin paper between the article and the face plate, will hold it.



CALCULATING PULLEY SPEED.

The mechanic and repairman engaged in motor car and other machine work must compute the speeds of pulleys, and to facilitate calculation the following rules are given. The results obtained will be practically correct, though the circumference of the driven member will not turn so fast as that of an equal sized driver because of elasticity and slip of the driving belt.

Problem 1.—The diameter of the driver and driven being given, to find the number of revolutions of the driven:

Rule.—Multiply the diameter of the driver by its number of revolutions, and divide the product by the diameter of the driven; the quotient will be the number of revolutions.

Problem 2.—The diameter and revolutions of the driver being given, to find the diameter of the driven, that shall make any given number of revolutions in the same time:

Rule.—Multiply the diameter of the driver by its number of revolutions, and divide the product by the number of revolutions of the driven; the quotient will be the diameter.

Problem 3.—To ascertain the size of the driver:

Rule.—Multiply the diameter of the driven by the number of revolutions you wish to make, and divide the product by the revolutions of the driver; the quotient will be the size of the driver.

The above rules are practically correct. Though, owing to the slip, elasticity, and thickness of the belt, the circumference of the driven seldom runs as fast as the driver.

MARKING THE TOOLS.

Many repairmen mark their tools for indentification as well as to prevent accidental borrowing by others. No name stamp or steel letter or figure can be made that will stand to stamp saw blades or steel tools. They will mark all soft metals, such as brass, copper, soft cast iron or annealed cast steel. utilize a prick punch to mark wrenches, etc. rules, squares, etc., or any fine tool, should never be marked with a metal instrument as it will throw them out of true. Tools may be marked, however, by etch-To accomplish this on iron or steel take onehalf ounce of nitric acid and one of muriatic. Mix these by shaking thoroughly. Cover the place to be marked with melted beeswax and when cold write the inscription plainly in the wax clear to the metal with a sharp instrument. Apply the acid with a feather, taking care to fill each space. Allow the acid to remain from one to 10 minutes, according to the appearance desired. Then wash with water and remove the wax.

A NEW PLATING PROCESS.

According to Motor Traction, an English concern has introduced a new electro-chemical process for plating, with various metals and alloys, on a number of different materials, such as wood, glass, china, aluminum (the latter without the use of graphite), and metals of all kinds. The inventors of this process are

two Italian chemists who have spent many years is perfecting their methods. When plating china o glass, a flux is used which may be likened to that o a tinning process on copper and brass, and it appear that the flux has the effect of causing the metal and th glass or china to become united closely. It is claime that plating by this method will appeal to manufacturers of motor car parts and accessories as it is said to be about 40 per cent. cheaper. The process als includes a new method of zinc galvanizing.

PULLEYS VS TUBING FOR CABLES.

In fitting muffler cut-outs or signal devices, which are operated by a pedal, to the motor car, the common practise is to utilize a pulley where the cable passe around sharp bends. This is more or less noisy especially if the cable be loose. The use of copper tubing is suggested by a repairman who employs the material when equipping signal devices, etc., and he state that not only is the noise eliminated but that the wir may be operated fully as easily as with the pulley. The tubing is cut to size, bent to the desired angle and at tached to the body or floor boards by staples. The ends of the tube are flared slightly to prevent the wir from chafing. The tubing will wear out in time, but it is inexpensive and usually there are odd pieces it the scrap heap which may be utilized for this work.

SIMPLE TESTS FOR WATER.

The use of hard water in the cooling system of motor car is detrimental as the fluid upon heatin forms a boiler scale upon the water jackets which i deposited in the radiator in the shape of a fine, bric colored powder. This reduces the efficiency of the cooler and will in time clog the member.

A test to ascertain the condition of the water mabe made easily with articles which any druggist keep in stock. A few glass vials or test tubes are all that are needed. Make a soap solution and fill a tube about half full. Then add a few drops of the water to be examined. If the fluid be hard the solution will turn a milky color or curdle.

The presence of iron may be detected by adding one drop of ferrocyanide of potassium to a little of the water in a test tube. The fluid will turn blue if iron be present.

BRASS AND COPPER TUBING DEFECTS.

In purchasing brass and copper tubing the material should be inspected for flaws or defects, especially when the former is to be utilized for pipin acetylene from a gas tank. Seamless brass tubin should have an equal thickness all around, and should be annealed slightly to prevent its being too britt for working. The hard varieties are liable to splinot only while being worked, but after they have been in service for some time. When brazed brass or copper tubing is utilized the seams should be examine carefully. Pittings for brass pipe should be inspected for sand holes and flaws. The screw threads should be deep and full.





"Always There"

SPLITDORF IGNITION has made its CHAMPIONSHIP quality felt for all time with a RECORD OF ACCOMPLISHMENT never equalled. Study these facts:

The WORLD'S RECORD for a road race, 74.65 m.p.h. was won and is held by Harvey Herrick with his SPLITDORF EQUIPPED National.—Santa Monica, Cal., Oct. 14, 1911.

The WORLD'S STOCK CAR STRAIGHTAWAY MILE RECORD was won and is held by Howard Wilcox with his SPLITDORF EQUIPPED National "40."—Pablo Beach, Fla., March 28-31, 1911.

The WORLD'S BEACH RECORDS for the 50, 200, 250 and 300-mile marks were won and are held by Louis Disbrow with his SPLITDORF EQUIPPED Pope-Hummer.—Pablo Beach, Fla., March 28-31, 1911.

The 1911 STOCK CAR CHAMPIONSHIP was won by Len Zengel and his SPLITDORF EQUIPPED National.—Elgin, Ill., August 26, 1911.

The TOURING CHAMPIONSHIP—the 1911 GLIDDEN TOUR, was won by three SPLITDORF EQUIPPED Maxwells.

The Los Angeles-Phoenix "DESERT RACE"—the TIEDEMAN TROPHY at Savannah, Ga.,—the Chicago Motor Club's TEAM TROPHY—the FREE-FOR-ALL at Bakersfield, Cal.—the ILLINOIS TROPHY—the 301 c. i. to 450 c. i. CLASS EVENTS in the FAIRMOUNT PARK, the PANAMA-PACIFIC and the SANTA MONICA road races were all WON by SPLITDORF EQUIPPED cars.

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FEATURES OF THE 1912 MOTORCYCLE.

Trend of Design Toward Matters of Refinement and Comfort-Lower Prices, Greate Value and Better Service Offered for the Coming Season.

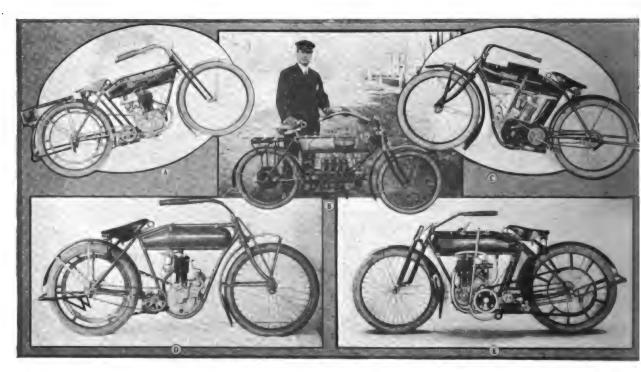
MOTORCYCLISTS who have followed the development of the mechanically propelled road bicycle since its inception did not anticipate any radical changes in the trend of design for the 1912 models. Early announcements of the makers were sufficient indication of the new machines, and it was made manifest long before the shows opened that all improvements would be in the nature of refinements in constructional details and comfort.

Working along these lines the manufacturer has produced a quiet running mount, one easily operated and controlled, and capable of transporting the rider long distances without discomfort. And it is inter-

Refinement in this respect applies also to the han dle bars and forks. The former are lower, longer wider and consequently more comfortable, and is perfecting these details, strength and security hav not been overlooked. Of the changes in forks it may be said many makers have found room for improve ment. Taken as a whole the 1912 machines are better all around, and with prices lower the purchases will receive even greater value and better service than heretofore.

Motors.

Relative to motors it will be noted that the ligh powered engine practically has been abandoned as bu



Some 1912 Motorcycles: A, R-S; B, F, N.; C, Indian; D, Pope; E, Minneapolis-All Singles Except F, N.

esting to note that at least three makers have discarded the pedal for starting purposes. Two of these utilize a hand crank while the third employs a foot lever. Similar devices will be fitted, as the demand is bound to increase among the class of riders who do not care to exert themselves unnecessarily.

In the matter of comfort considerable improvement has been accomplished; in fact, a careful consideration of the leading machines shows that much thought and study have been given toward eliminating road shocks and vibration. Many cushioning devices noted in 1911 mounts have been improved greatly while other makers incorporate these in their new designs, providing comfortable riding qualities.

three makes of singles fit less than a four horsepower motor, and these are 3.5. The single continues to be the popular type, and of the 67 models listed by The Automobile Journal, 48 have but one cylinder and the balance are twins or four-cylinder machines. The four horsepower single predominates, 30 models being thus equipped. Twelve machines are fitted with five and three with 3.5 horsepower motors. The seven horsepower twin is still a favorite and a new addition utilizes a five horsepower engine. The ranks of the four-cylinder mounts have been recruited by the Henderson, a new machine, and this, like the Pierce, is rated at seven horsepower. The F. N., a well known multi-cylinder mount, is equipped with a five

horsepower engine. In cylinder design there is a decided tendency toward the one-piece construction.

The mechanical inlet valve of which the overhead rocker type is most popular, is gaining slowly, but the automatic is most favored. There is a growing tendency to place the valves side by side, although the inlet over the exhaust arrangement predominates. One valveless motor is noted in the Schickel, which two-cycle machine was exhibited in the East for the first time at the Madison Square Garden show.

It is noticeable that the advocates of the ball bearing for the motor are making gains as also are those favoring the roller, but the plain bearing adherents show a majority. Many minor refinements contribute toward a quiet running power plant.

Practically all of the models are equipped with the true high-tension type of magneto, the battery only being fitted to a few of the cheaper machines. Bosch, Splitdorf and Herz are the leading magneto makes. The makers of the Bosch and Splitdorf present new models, that of the former being with end plates, and dirt, oil and water proof.

There is no noticeable change in the construction of carburetors and the automatic type leads in numbers. The Schebler, Heitger and Breeze predominate, the last two named utilizing independent jet adjust-



Harley-Davidson 6,5 Horsepower Twin,

ments while the Schebler actuates the opening by the throttle. Auxiliary air is regulated automatically; that is, according to the speed of the piston. The Hedstrom (Indian) carburetor has both air and gas adjustments. Variations are noted but the principles upon which they operate are similar.

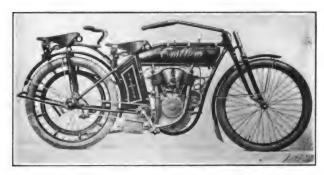
Lubrication.

In the matter of lubrication the advocates of the pump system have gained, the Yale and Henderson adopting this method. The force feed has lost ground, and the majority utilize either gravity or mechanical means for conveying lubricant to the crankcase. Sight feeds are popular and a larger number of models is equipped with oil windows to observe the level of the fluid within the crankcase. The hand pump has its adherents and some makers fit this as an auxiliary. A careful consideration of the oiling systems denotes

a tendency toward a standard installation.

Touring with the motorcycle is no doubt responsible for increasing the capacity of both the fuel and oil tanks and it is interesting to note that the manufacturer has made provision for long trips. Refinements have been made in the containers, as well.

Regarding brakes the makers are divided in opinion as to the coaster and band, and both are fitted to some mounts. Relative to the agitation against the muffler cut-out, statistics show that less than half a dozen do not fit these devices. In explanation it may be said that the demand is such as to require



Emblem Seven Horsepower Twin.

recognition upon the part of the manufacturers.

Advocates of the chain drive will note with satisfaction the growing tendency to adopt this method of transmitting power. The leading adherent of this form has been joined by several others some of whom were formerly staunch admirers of the belt, although one or two utilized the chain for racing purposes. Three well known makers now include a chain driven machine among their models and several utilize this form entirely, and the new four-cylinder Henderson also utilizes this method. The most popular form is a double drive through a countershaft, but where the motor is undergeared the direct chain is employed. The standard size is a .3125 roller. flat belt, however, outnumbers the V, chain and shaft, and where high powered engines are employed the width of the belt has been increased and in some instances is more than two inches across.

Variable Speed Gears.

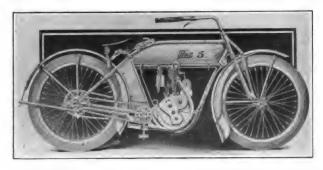
In contrast to last season, variable speed devices were conspicuous by their absence at the New York shows and those exhibited may be classed as: Sliding gear, dog clutch gear and planetary. Some include it as a standard equipment while others list it as extra. Practically every mount for 1912 is fitted with some form of free engine device, and in this respect the multiple disc type predominates although it will be noted that the cone pattern has made its appearance.



Henderson Seven Horsepower Four.

On the flat belt machines the idler is generally used, serving a double purpose by taking up the slack of the belt and freeing the motor. In one mount a





Thor Five Horsepower Single.

multiple disc type of clutch is fitted in addition. this case two levers are employed, one for the idler and the other for the clutch. The prevailing form of free engine device where the V belt is used is the multiple disc, usually the Eclipse.

Although there are many refinements noted in forks there is still a difference of opinion as to which type will ultimately be universal or standard. There appears to be a growing tendency toward the single type utilizing two springs, one for the shock and the other for the recoil. As a whole, however, the manufacturer has incorporated minor changes in construction. Both the single and double plunger have their advocates as have the truss.

Spring frames are favored by two makers and additions have been made to the ranks of the spring seat posts, three makers utilizing these for the first time.

The wheelbases remain about the same, averaging



Schickel Five Horsepower Valveless,

from 53 to 55 inches. The extreme is noted in the Henderson which is 65 inches. Twenty-eight inches remains the standard wheel size, there being one exception, that being 26 inches utilized on a single mount. Two and one-half inches is the standard tire equipment although three makers fit 2.75 to their mounts and another 2.25. Spokes and rims are heavier. Quick detachable front axles are fitted to every mount, but only one maker incorporates this desirable feature in the rear hub, where it is even more essential.

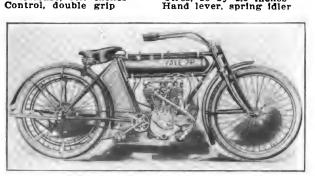
Control by twisting grips is practically universal. There is a tendency to operate the exhaust valve lifter by a separate lever, a practise in vogue abroad. Tandem attachments are announced by several concerns, these devices being listed as extra. The side car, so popular in England, is being introduced, but is not used to any great extent.

DETAILED SPECIFICATIONS OF THE 1912 MODELS.

Emblem

Flanders

4 horsepower single, flat belt,	magneto\$175
Intake valve, automatic	Magneto, Splitdorf
Carburetion, Kingston	Lubrication, gravity, sight
Gasoline capacity, 1.5 gal.	Oil capacity, 1.5 qt.
Forks, cushion plunger	Brakes, one coaster
Wheelbase, 53.5 inches	Tires, 28 by 2.5 inches
Control, double grip	Hand lever, spring idler



Yale Seven Horsepower Twin.

Indian.

Henderson.

.......\$235

7 horsepower twin, chain,	magneto\$23		
Valves, mechanical	Magneto, Bosch		
Carburetor, Breeze	Lubrication, gear pump		
Gasoline capacity, 2.25 gal.	Oil capacity, 2 qt,		
Forks, cushion plunger	Brakes, one band		
Wheelbase, 65 inches	Tires, 28 by 2.5 inches		
Control, double grip	Disc clutch, countershaft		



Flanders Four Horsepower Single.





M-M Eight Horsepower Twin.

Pierce.

7 norsepower tour-cyllinger,
5 horsepower single, flat or
5 horsepower single, flat or
5 horsepower single, flat or
Valves, mechanical Carburetor, Breeze Gasoline capacity, 2 gal, Forks, cushion plunger Wheelbase, 60 inches 4-cyl.; 54 inches single Control, double grip Multiple disc clutch, 4-cyl., 3265 model; idler single

----- four oulinder

 shaft, magneto
 \$400

 V belt, magneto
 265

 V belt, magneto
 250

 V belt, magneto
 225

 Magneto, Herz
Lubrication, mechanical, 4cyl; hand pump, single
Oil capacity, 2.5 qt.
Brakes, Corbin band, single; Corbin band and
hand 4-cyl.
Tires, 28 by 2.5 inches

Harley-Davidson.

7 horsepower twin, chain, m 6.5 horsepower twin, flat bel
4 horsepower single, flat bel 4 horsepower single, flat bel
Intake valve, automatic
Carburetor, Schebler Gasoline capacity, 1.5 gal.
single; 2.5 twin Forks. cushion
Wheelbase, 55 in single;
56.5 twin Control, double grip

nagneto....\$285 lt, magneto.....275 lt, magneto.....235 lt, magneto.....200

Yale.

7 horsepower twin, nat t
5 horsepower twin, flat b
4 horsepower single, flat b
4 horsepower single, flat b
Valves, mechanical
Carburetor, Heitger
Gasoline capacity, 2 gal.
Forks, cushion plunger
Wheelbase, 57.5 inches
Control, double grip
Tandem attach., \$20 extra
-

Wagner.



Merkel Seven Horsepower Twin.



Excelsior Seven Horse	power Twin.	
Marvel.		
Carburetor, Heitger Lub Gasoline capacity, 2 gal. fl Forks, — Oil Wheelbase. 58 inches Bra	rneto\$225- gneto, Bosch rication, constant level oat capacity, 2 qt. kes, — se, optional	
Ecl	ipse free engine device	
M-M.		
8 horsepower twin, flat belt, m 4.5 horsepower single, flat belt, m 4 horsepower single, flat belt, m 4 horsepower single, flat belt, bu	agneto	

Magneto, Bosch Lubrication, hand pump Oil capacity, 1.5 qt. twin; 1 single Brakes, optional Tires, 26, 26-28 by 2.5 in. Belt idler, drum clutch V belt twin; 4.5 h, p. \$15 extra

	CALLA		
Merkel.			
6 horsepower twin. V or fit 4 horsepower single, V or fit	at belt, magneto. \$275 at belt, magneto. 250 at belt, magneto. 225 at belt, magneto. 200		
Intake valve, automatic Carburetor, Merkel	Magneto, Bosch Lubrication, automatic,		
Gasoline capacity, 1.75 gal. Forks, truss spring Wheelbase, 53 inches	hand pump Oil capacity, 2 qt. Brakes, band, belt; coaster.		
Control destal	-1-1-		

Control, double grip Spring frame, except \$200 model \$200 Chain Tires, 28 by 2.5 inches Multiple disc clutch Schickel. 5 horsepower single, flat belt, magneto.....\$225 Magneto, Eisemann Lubrication, oil mixed with

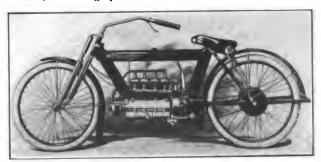
Valves, none Carburetor, Schebler Gasoline capacity, 3 gal. Forks, tension spring Wheelbase, 57 inches fuel
Oil capacity, no tank
Brakes, optional
Tires, 28 by 2.75 inches
Belt idler Control, -

Iver-Johnson.

4.5	horse	epower	single	. V
Va:	ves,	mechan	ical	
		or, Sci		
		capac		gal.
		russ_sp		
		se, 56		1
Cor	atrol.	double	grip	

W belt, magneto......\$250

Magneto, Bosch
Lubrication, hand pump
Oil capacity, 2 qt,
Rrakes, Corbin band
Tires Tires Double cone clutch



Pierce Seven Horsepower Four.



The	or.	N. S. U.							
5 horsepower single, chain, 5 horsepower single, chain, 4 horsepower single, chain, 4 horsepower single, chain, 4 horsepower single, chain, 4 horsepower single, chain, Intake valve, automatic 4 h. p.; others mechanical Carburetor, Thor	magneto	3.5 horsepower twin, V beit, Valves, mechanical Carburetor, N. S. U. Gasoline capacity, 1.5 gal. Forks, F. N. spring Wheelbase, 54 inches Control, double grip	magneto						
Gasoline capacity, 6, 8, 11 quarts	Brakes, Thor Tires, 28 by 2.75 inches	F.							
Forks, truss spring Wheelbase, 55.5 inches Control, double grip Exce	Multiple disc clutch Two-speed on twin, \$25 ex- tra lsior.	5 horsepower, 4-cylinder, sh Valves, automatic Carburetor, F. N. Gasoline capacity, — Forks, tubular	aft, magneto\$350 Magneto, Bosch Lubric't'n, pump in oil tank Oil Capacity, 2 qt. Brakes, two						
7 horsepower twin, chain, m 6 horsepower twin, belt, man 4 horsepower, single, belt or 4 horsepower single, belt, man 4 horsepower single, belt, ba	chain, magneto	Wheelbase, 56 inches Control, levers Two-speed slid. gear extra	Tires, 26 by 2.5 inches Multiple disc clutch						
Valves, mechanical	Magneto, Bosch		t, magneto\$250						
Carburetor, Schebler Gasoline capacity, 1.75-2 gal, single; 2.75 twin Forks, scroll leaf Wheelbase, 57 inches Control, double grip	Lubrication, sight feed Oil capacity, 1 qt. single; 1.5 twin Brakes, one coaster Tires, 28 by 2.5 inches Excelsior free en. clutch	4 horsepower single, flat bel Valves, mechanical Carburetor, Schebler Gasoline capacity, 2 gal. Forks, Detroit spring	Magneto, U. & H. Lubrication, automatic, sight feed Oil capacity, 1.5 qt.						
Have		Wheelbase, 60 inches Control, double grip	Brakes, Corbin band Tires, 28 by 2.5 inches						
4 horsepower single, flat be Intake valve, automatic Carburetor, Schebler Gasoline capacity, 1.5 gal. Forks, — Wheelbase, 54 inches Control, —	Magneto\$175 Magneto, Bosch Lubrication, hand pump Oil capacity, 1.5 qt. Brakes, Eclipse Tires, Eclipse free engine device		Detroit idler Era. magneto\$285 Magneto, Bosch Lubrication, sight feed, hand pump						
Wave	erley.	Forks, compound spring	Oil capacity, 1.5 qt						
Valves, mechanical Carburetor, Heitger Gasoline capacity, 2 gal.	nagneto	Wheelbase, 62.5 inches Control, double grip Tandem seat, \$15 extra	Brakes, New Era, exp. Tires, 28 by 2.75 inches Clutch, disc, countershaft, two-speed planetary						
Forks, Waverley spring Wheelbase, 56.5 inches	Brakes, Corbin band Tires, 28 by 2.5 inches	Peer	rless,						
Control, double grip Minne 5 horsepower single, 2-speed 5 horsepower single, 2-speed,	Eclipse free engine device apolis. , chain, magneto\$285 , belt, magneto285	Valves, — Carburetor, Kingston Gasoline capacity, 1.5 gal. Forks, coach spring type	V belt, magneto\$225 Magneto, Bosch Lubrication, hand pump Oil capacity, 1.5 qt. Brakes, one coaster.						
5 horsepower single, belt, m Intake valve, mechanical	agneto	Wheelbase, — Control, double grip	Tires, 28 by 2.5 inches Hand operated belt idler						
Carburetor, Schebler Gasoline capacity, 2 gal.	Lubrication, hand pump Oil capacity, 3.5 qt	Eclipse clutch, \$15 extra							
Forks, triple spring	Brakes, one coaster		Standard.						
Wheelbase, 55 inches Tandem attachment extra	Tires, 28 by 2.5 inches Spring frame, \$15 extra	4 horsepower tourist single,	agneto\$290 flat belt, magneto250 lt, magneto						
	pe. t magneto \$175	Valves mechanical	Magneto, Bosch						
Valves, mechanical Carburetor, Breeze Gasoline capacity, 1.75 gal. Forks, cradle spring Wheelbase, 54 inches	t, magneto	Carburetor, Schebler Gasoline capacity. 2.5 gal. Forks, cushion plunger Wheelbase, 55 inches Control, double grip Clutch, \$10 on twin	Lubrication, sight feed, hand pump Oil capacity, 2 qt. Brakes, coaster, band Tires, 28 by 2.5 inches Belt control						
· NEW/	MECHANICAL FEAT	LIDES AND ININOVA	TIONS						

NEW MECHANICAL FEATURES AND INNOVATIONS.

The 1912 motorcycle presents numerous new mechanical features and these always prove of interest to the enthusiast who has followed the progress of construction from year to year. Several innovations have been introduced by well known makers while new entrants in the field contribute details which differ from the standard form.

Although a two-stroke motor was exhibited at Chicago last season it was not until recently that the eastern enthusiasts were given an opportunity to inspect the Schickel valveless design which contains many ingenious and novel features. But one flywheel is fitted instead of the usual pair. This is a drop forging, the main shaft and crankpin being integral with the disc. The inner face of the flywheel is recessed and equipped with a large ball bearing, the balls being .5625 inch. The driving pulley has cork inserts in its face, and runs on a .5-inch ball bearing set in the centre of the wheel.

There are no gears on the motor, the magneto being driven off the crankpin by a "banjo" disc. The magneto is enclosed entirely in a housing cast on the right side of the motor base and the magnets are rocked, giving a maximum advance at all times. The upper part of the frame serves as a fuel and oil container, these fluids being mixed and fed through the carburetor. The oil measure is contained in the filler cap and holds about .2 pint, which is the proportion for each gallon of fuel. The front fork is a departure from the usual construction, the main member being practically a three-plate crown fork with a doublebridged truss in front, the upper end of the latter being secured to the lamp bracket. In front of the truss are two plunger rods, their lower ends connecting with the rocker arms.

A distinct design is the eccentric flywheel of the Flanders which model is noticeable for its simplicity. Here the exhaust valve is actuated by direct thrust

from a single cam gear on the side of the crankcase and is fitted with a screw adjustment for wear on the tappet. The automatic inlet valve spring is adjustable, the stem being threaded.

The Iver-Johnson has a radically different engine as the crankpin is in two pieces, one being tapered and the other threaded for a locking nut. This member fits into a corresponding projection from the other half of the crankshaft, forming a solid pin. The main shaft proper consists of two hollow members with very large bearing surfaces.

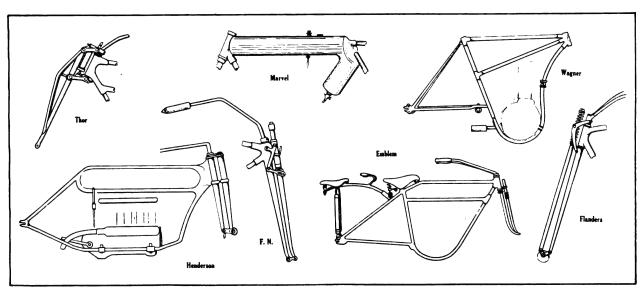
The Minneapolis utilizes a unit power plant; that is, the motor base and the housing of the change speed are constructed together while on other mounts the speed device is incorporated as a separate part.

The motor of the Thor twin is noticeable because of the angle of 50 degrees, the extra five being held by the maker to add strength. A novel feature of the engine is the arrangement whereby the magneto may be removed without disturbing the gear or timing.

The new Henderson four presents original features

ployed to operate the inlet valve is shown in the New Era. The first magneto idler gear carries an integral formed cam which actuates the inlet pushrod; the second idler gear, carrying another one-piece cam, trips the exhaust valve. There are but four gears in the motor, the idler magneto members being utilized as timing gears also. Another form of gear drive is that of the Iver-Johnson which utilizes a skew gear.

Attention to small details is an important factor and in this respect the maker of the Indian mount has incorporated two devices which will appeal to motorists. One of these is a magneto switch attached to the handle bar. When the key is removed from the lock it is impossible to start the motor. The other is a little gasoline gun built integral with the tank cap. A Thor innovation is a priming cup, which is threaded onto a tap from the fuel tank. The member is unscrewed from its position, held under the tap, filled, and one end held by the finger or thumb until it is emptied. Its convenience is self evident.



Some Conventional Types of Spring Forks and Frames Utilised on the 1912 Mounts,

the most marked being fins cast on the under side of the motor base to radiate heat and these also serve to reduce the temperature of the oil. The engine is considerably larger than other motors of this type, having a 2.5-inch bore and three-inch stroke.

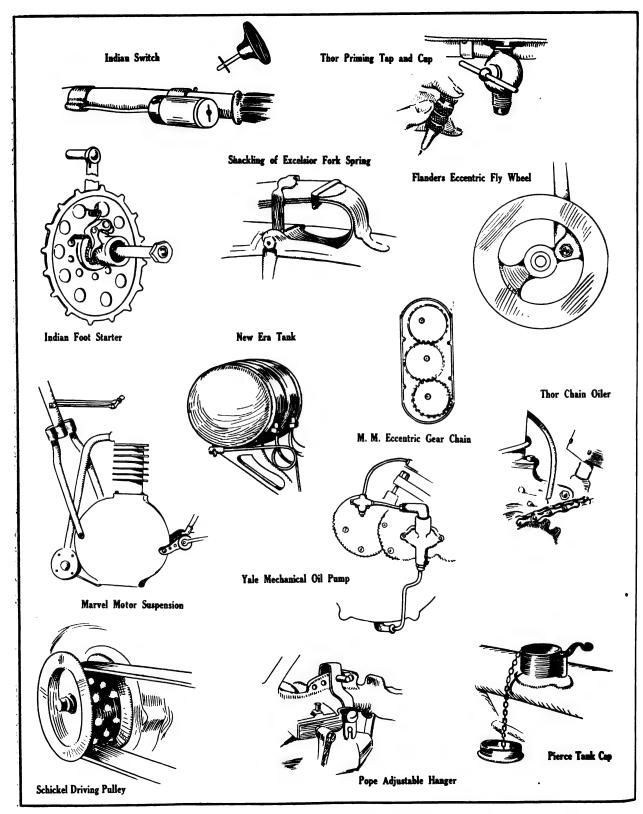
The Harley-Davidson has relocated the inlet valve pushrod tension springs at the lower end of the rods in cups, just above the crankcase. These were formerly on top of the valve domes. The new method permits of heavier springs, which are not exposed to as great a heat. Another innovation in motors is the fitting of a breather to the crankcase on the Thor, the pipe leading to and over the driving chain which is lubricated by the oil mist.

Although driving the magneto by gear is universal, a variation of this method is noted in the M-M which utilizes three eccentric members running directly up from the camshaft. The action of this system is such that the speed of the magneto armature is increased just at the instant of ignition.

An instance of where the magneto gears are em-

No radical departure is noted in spring forks and frames, although it is noticeable that the coil spring fork leads in numbers. This method is utilized also to obtain a cushioning effect in the frames, the most noticeable of which is the Merkel. The F. N. is equipped with improved forks, which are a combination of rocker and plunger coil spring. The axle is attached to the plunger member which has the shock and recoil springs in a separate housing. To the crown of the plunger member is fastened a compound linkage, pivoting to the steering head and coupled at its upper end to the lower side of the recoil spring.

Although the Emblem spring fork remains unchanged the handle bars have been altered slightly, three stems being utilized instead of two, a centre member having been added. The latter is fitted with an expander and bolt, which is employed for fastening the bar. This construction, having as it does two additional bars, prevents possible twisting of the parts as well as eliminates a clamp and makes for a



Constructional Features Which Make Their Appeal to the Mechanical Motorcyclist,

lower position. The handle bars are 2.5 inches shorter, which permits of the tandem saddle being brought forward and over the centre of the rear wheel. The device is fitted with adjustable foot rests. In addition to the Emblem, several other makers list a tandem attachment.

Advocates of the chain drive enclose these members, the Henderson fully covers the single chain while the Excelsior and Harley-Davidson enclose the short chain and the Indian and Merkel, partially.

An innovation in a two-speed model with flat belt is the Minneapolis, said to be the first of its kind. The belt pulley is mounted on the two-speed countershaft, providing an undergeared drive and permitting of the use of pulleys more nearly equal in diameter than is usual. The free engine effect is obtained in the neutral notch of the gear shift quadrant, while the belt may be slipped by relieving the idler tension.

A deviation from the ordinary drive is noted in the Henderson. Located in an extension at the rear of the crankcase is a transfer shaft operated by a

bevel gear on rear end of the motor shaft. At the end of the latter is an Eclipse free engine chain drive clutch and from this a single chain connects with a driving sprocket on the rear wheel. The chain, which is enclosed, is accessible through a hinged door.

A noticeable feature of the Pope single is an independent c h a i n adjust-

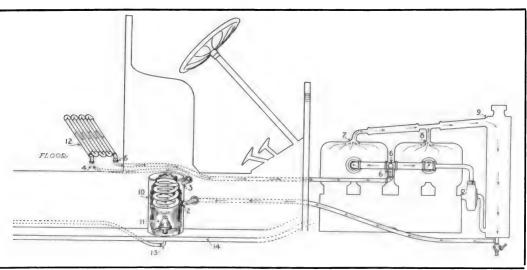
ment. This is obtained by a yoked lever with slotted ends, the openings embracing two studs. From the central portion of this lever at each side two link plates engage the end of a square section crank hanger, whereby a rocking motion of the yoke lever gives the necessary movement to the crank hanger. A flange extending upward on top of the frame member, which is fitted with five holes placed in a circle concentric with the frame studs, provides means for locking with a pin. Additional security is brought about by cap screws passing through the upper portion of the frame member bearing on the hanger.

A novelty introduced by the Pierce line is a quick detachable tank filler cap, a snap spring holding the part, the usual threads being dispensed with. A chain prevents loss of the member. Owing to a lack of space it is not possible to enumerate all of the interesting features found on the 1912 motorcycles although many ingenious devices have been incorporated by the manufacturer.

Universal lighting and uniform laws are the prime necessities for safe and sane motoring.

JAMES THERMOS AUTO HEATER.

A device which, it is claimed, will keep the water in the cooling system of an automobile from freezing during the coldest weather, and which may be employed for heating the car as well, has been invented by Charles C. and George C. James of New York City. The appliance is known as the James Thermos auto heater and is operated by a small gas burner housed in a brass tank on the running board. is similar to that utilized in steam cars, the gas being generated from the gasoline of the usual tank. The principle of the invention is circulating heated water by thermo-syphon when the motor is not being operated. The housing which encloses the heater is about half the size of an ordinary gas generator. The bottom of the device is filled with a gauze, preventing the ignition of liquid gasoline. The burner is so constructed that it is said to be impossible to extinguish the blaze except by hand or the safety valve. An extra safety device in the shape of a thermostat is fitted,



James Thermos Auto Heater Designed to Prevent Freezing, Also to Heat the Interior of the Car.

this automatically keeping the fuel line open when the burner is in use and closing the line when the flame is extinguished.

Above the burner is a coil of piping 10 and when the cold water becomes heated it flows through the pipe 3, 4, to the radiator 12 and leaves by another pipe 5 and enters the lower manifold 6 and proceeds through the upper members 7, 8, and returns to the radiator 9. The cold fluid leaves the radiator at its lowest place and enters coil by a pipe 2 where it is heated and the operation repeated, circulation being effected by thermo-syphon; that is, the hot water rises being displaced by cold.

A check valve is fitted in the lower manifold and its function is to confine the hot water to the coil in the car and burner when the motor is not being operated. The gas line 13 is connected to a small pressure fuel tank which is not shown in the illustration.

In addition to heating the car, contributing to the comfort of the passengers, and preventing freezing of the circulating system, it is pointed out by the inventors that starting the motor is facilitated as the engine is always warm.



Adopts Franchise Plan.

During the New York show, the board of directors of the Federation of American Motorcyclists adopted what has come to be known as the franchise plan in an effort to encourage the building and maintenance of board tracks for racing purposes. Under this plan the F. A. M. agrees to issue sanctions to but one track in a city, the promoters of the favored track to pay an annual fee, ranging from \$125 to \$750, according to the size of the city.

A proposition was made to the Canadian clubs, under which the F. A. M. agrees to grant sanctions for race meets to affiliated clubs in the Dominion and give permission to American riders to compete in meets held by such organizations and no others.

The matter of revision of rules was postponed until an adjourned meeting which will be held during the Chicago show.

Indian Agents at Factory.

The New York show brought together a large number of Indian agents from all parts of the country, and at its close several of these assembled at the factory of the Hendee Manufacturing Company, Springfield, Mass., where they were entertaind by F. J. Weschler, treasurer and sales manager. Among those present

were: H. B. Clark, Buffalo, N. Y.; George H. P. Stone, Ilion, N. Y.; Joseph V. Voll, Walter Rothmiller and H. R. Williams, Lancaster, Penn.; A. E. Gettys and George F. Hewitt, Harrisburg, Penn.; A. G. Schmidt, Pittsburg, Penn.; John Rawlings, Scranton, Penn.; S. F. Weary, Mt. Carmel, Penn.; John Sykes, Jr., Trenton, N. J.; Edward Stauder, Rochester, N. Y., and Charles Daycock, Rome, N. Y.

Dr. Thornley's Advice Offered.

In view of the fact that a number of contracts were signed last year by riders who did not properly protect their interests, either personal or as members of the F. A. M., Dr. J. P. Thornley, chairman of the competition committee, requests that every rider who contemplates signing a contract to race for a promoter during 1912 shall submit it to him for his advice. It is expected that this will do away with such schemes as forcing F. A. M. members to ride at outlaw meets, etc.

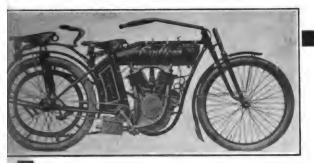
Eastern Tourists Receive Diplomas.

Secretary G. B. Gibson of the Federation of American Motorcyclists has issued diplomas to the following members, who have been certified by Tourmaster B. A. Swenson of Providence, R. I., as having completed the eastern tour to the Buffalo convention with

perfect honors: Merle B. Mann, Hartford, Conn.; Clifford Frazier, Pawtucket, R. I.; B. A. Swenson, Providence, R. I.; R. M. Howard, Westminster, Mass.; A. B. Howe, Boston; Adolf Tornquist, Pawtucket, R. I.; Eugene Miller, New York City; Albert Burrill, Utica, N. Y.; J. P. Seery, Camden, N. J.; Charles Dahlenburg, Miami, Fla.; F. L. Kidder, Worcester, Mass.; John W. Brewer, New York City; John Kay, Providence, R. I.; Herman Krackowizer, New York City; H. R. Davis, Newark, N. J.; Russell Coes, Worcester, Mass.; G. H. Hinman, New Haven, Conn.; H. A. Truffner, Newark, N. J.; William Woods, New York City; Fred Voelker, New York City; Robert Duttler, Jr., New York City; John W. Howell, Camden, N. J.; Peter A. Cox, New Haven, Conn.; H. F. Mc-Payne, Pittsburg, Penn.; Philip Kennard, Tampa, Fla.; M. E. Gale, Angola, N. Y.; W. P. Leahy, Hartford, Conn.; J. M. Simmons, Wilmington, Del.; P. W. Stevens, Newark, N. J.; E. L. Buffington,



Two Views of the New Sidecar Brought Out by the Majestic Manufacturing Company, Worcester, Mass.



THE MACHINE YOU WANT AT THE PRICE YOU OUGHT TO PAY

YOU CANNOT FIND BETTER VALUE ANYWHERE AT EVEN HIGHER PRICE

Distributors for California-John T. This is only one of our several models for 1912. The 4 H. P. battery single at \$175, and the same machine with magneto at \$200; the 5 H. P. battery single at \$200 and its counterpart with magneto at \$225; and the big, powerful 7 H. P. magneto twin at \$250, gives dealer and rider a wide range for selection. And, most important of all-EVERY MACHINE FITTED WITH FREE ENGINE AND VARIABLE SPEED CLUTCH WITHOUT EXTRA CHARGE

Our line of famous motorcycles is the natural outcome of many years' experience in the manufacture of high grade bicycles. Also do not forget that we still are MAKING MORE AND BETTER BICYCLES THAN EVER BEFORE and if we are not represented in your vicinity it is strictly up to you to "Obey That Impulse" and write today for agency proposition.

EMBLEM MANUFACTURING CO. Member ANGOLA, ERIE CO., NEW YORK

Providence, R. I.; P. H. Sheridan, Cleveland, O.; H. F. Smith, Medford, Mass.; George Reichy, Newark, N. J.

Harleys for the Government.

The Harley-Davidson Motor Company, Milwaukee, Wis., announces that it has sold another Harley-Davidson machine, a 1912 model with Ful-Floteing seat and free wheel control, to the United States government for use at the reclamation station in Boise, Ida. Other mounts of this make now owned by the government are used as follows: Philadelphia navy yard, geological survey, and forestry work in Oregon.

M-M Stays in Brockton.

Although there have been a number of rumors to the effect that the American Motor Company, maker of M-M mounts, would leave Brockton, Mass., to resume business in a western city, it is announced that the motorcycle end of the business will remain in its present location. A. R. Marsh has designed a new automobile, which is to be manufactured by a concern to be organized in Lima, O., under the name of the Lima Motor Car Company, according to the latest information.

Motorcycle "Glidden" Tour.

Unless all plans fail the F. A. M. will have its own "Glidden" tour this season. A. B. Coffman of Toledo, O., and A. J. Musselman of Chicago, have donated two cups which are offered as prizes for the best scores in a tour which shall embrace 2000 miles and occupy 10 days. One cup will be offered for trade riders and

The details have not the other for private owners. been worked out as yet.

Bill & Co., Los Angeles. For Oregon—Ballou & Wright, Portland. For Washington —F. M. Spinning, Seattle. For the South—

Henry

Keidel &

Maryland.

Co., Baltimore,

The Majestic Sidecar.

An accompanying illustration shows two views of the new sidecar, which is being made and placed in the market by the Majestic Manufacturing Company, Worcester, Mass. The idea is copied from the fitting which has become so popular in England, and it is anticipated that the construction and price will make it a decided favorite in America as well. It is pointed out that the mount may be used as a single carrier throughout the week and transformed into a family machine, or one in which a rider may take his best girl out for a spin, on Sunday. There are a number of

JOIN THE F. A. M.

which is the National Organization fostering the interests of motorcyclists along legislative and other lines. Cut this out, mail it, and you will get the reasons.

E. M. ESTABROOK

Chairman Membership Committee Federation American Motorcyclists, BANGOR, MAINE.

Please	send	me	the	F.	A.	M.	Book	clet	and	all	infer
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Name	٠	• •	•	 ٠.	٠	•	 •	•	٠	•	•	 •	•	•	 ٠	•	 •	•	•	٠.	•	•	•	٠.	•	٠.	•
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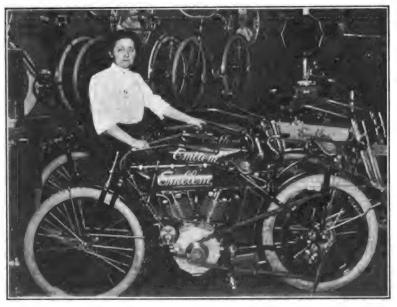
advantages, which will be apparent to all, and the Majestic company expects to do a large business.

Plans Spring Tour.

Harold Meline of Hollowville, N. Y., intends to spend the spring and summer months on a motorcycle tour of the South and West. He will go first by the way of Georgia, following along the Gulf to Texas and California, after which he will return to Fort Worth, Tex., thence over the northern route to his home.

Club Notes, Here and There.

The Humboldt Motorcycle Club has been organized in Chicago with 41 members. John Peska, 3545 West North avenue is secretary. The subject of affiliation with the national body is now being discussed.



Mrs. M. H. Snyder, Who Represents the Emblem Manufacturing Company in Columbus, O., and the Interior of Her Sales rooms.

Ivan King, 106 E. Randolph street, Enid, Okla., reports that he has a club about ready to form as a 100 per cent. affiliated organization.

Among the late affiliations are the following: Galveston, Tex., 211, E. R. Frank, secretary, 3616 J avenue, 25 members; Bushville, Ind., 212, W. C. Huedner, 105 East Third street; Bowling Green, O., 213, B. J. Walker, 105 Court street, 24 members; Independent Motorcycle Association, St. Louis, Mo., 214, C. B.

Cornwell, 398 North Jefferson street, 31; West Sig Motorcycle Club, Maricopa, Cal., 215, T. B. Haine box 99, 13; Grand Rapids, Mich., 216, A. W. Blodge 796 South Division street, 17.

President Edward Friedman of the Newark Motor cycle Club, Newark, N. J., announces the intention of that organization to affiliate with the national body; the near future.

Jack Horner, who disclaims any relationship to the little Jack Horner of fame, has organized a motorcyclub in Plainfield, N. J., and promises to have it and ated in time for the riding season.

Ernest Broadbent and George W. Stevens of Attleboro, Mass., are canvassing the 50 riders in that town with a view to the formation of a club in the near future. The idea is not to have a summer or-

ganization, but to incorporate such social features as will attract members throughout the entire year.

R. M. Charlton, St. Eleuthere, Quebec, has just taken out membership card No. 12,205 with the F. A. M., and is the most northern member on the Continent.

Otto F. Schacht of Waseca, Minn., has plans well laid for the organization of an affiliated club in time for the active riding season.

The Sacramento Motorcycle Club, Sacramento, Cal., has elected the following officers for 1912: President, E. S. Emery; vice president, H. A. Tenbush; secretary, Roy Emery; treasurer. N. F. Barber; captain, D. Galloway.

The Chattanooga Motorcycle Club, Chattanooga, Tenn., has selected the following as its officers for the ensuing year: President, Sergt. O. G. Von Long; vice president, Wells Boyd; secretary. Jesse Lesh; captain, Edward Marker.

Rudolph Basuerle, 1318 Lycoming street, Philadelphia, Penn., is organizing an F. A. M. club, and has 35 mem-

bers pledged. The prospects look good for a charter membership of at least 50.

Pompton, N. J., has a motorcycle club which was organized last April, but which has been taking a rather long vacation. It is announced that it will resume activities in February as an affiliated organization.

The Terre Haute Motorcycle Club, Terre Haute, Ind., has plans under way for a 100-mile race to be held in June.

INDIAN RIDERS

Cold weather is here. Motor turns over hard. Very hard work to get started. A little kerosene or gasolne injected into cylinder head will remedy this at once. A priming cup is needed in top of cylinder head, as it takes too much time to take out spark plug each time. Indian riders, send at once for a finely made and finished priming cup to fit top of cylinder head of your Indian. Price, postpaid, \$1 each. Money refunded if you are not satisfied.

B. A. SWENSON 298 Blackstone St., Car. Prairie Ave. Previdence, R. I.

The F. N. Shaft-Drive Motorcycles

Four cylinder ordinary automobile engine, compound spring fork, two powerful brakes, footrests if specified, combined luggage carrier and standling wheel base and large tires.......3350.60

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Boston, Mass.

Branches: 48 Union St., Prov., R. I.

415 Trumbull St.. Hartford, Ct.





The following concerns have been incorporated reently to manufacture or deal in motor cars, accessories,

Hudson Motor & Garage Company, Hoboken, N. J.; apital, \$50,000; incorporators, Christian C. Moller, Robert W. Fulcher, Mathilde Moller.

The H. & S. Auto Company, Springfield, O.; capital, 310,000; incorporators, John W. Hennessey, John P. Sultzbaugh. M. Ruth Sultzbaugh, Anna M. Hennessey, James M Collins.

Service Garage Company, Dunellen, N. J.; capital, 45000; incorporators, E. A. Craig, W. W. Stryker, Frederick Harrington,

Horst & Strieter Company, Rock Island, Ill.; capital, \$10.000; incorporators, Henry W. Horst, Henry T. Horst, Martin E. Strieter.

Henderson-Cole Motor Company, Dallas, Tex.; capital, \$10,000; incorporators, W. F. Bridewell, C. F. Hurst, F.

T. Bridewell. Centaur Manufacturing Company, Inc., Buffalo, N. Y.; capital, \$35,000; incorporators, A. Schmidt, Bertha F. Schmidt, J. E. Barry.

Central Garage Company, New Canaan, Conn.; capital, \$6000; president, Benjamin M. Mead; vice president, Harty C. Turner; treasurer, Harold H. Mead.

The Columbia Transportation Company, Camden, N.

J.; capital, \$50,000; incorporators, B. Johnson, C. U. Martin, J. A. MacPeak.

Webb-Veitch Company, Jersey City, N. J.; capital, \$25,000; incorporators, C. N. King, Jr., G. H. Russell, E.

Bath Garage Company, Bath, Me.; capital, \$10,000; in-

corporators, Charles W. Clifford, Charles W. Clifford, Jr., John E. Goff.

Nuse Wagon & Automobile Company, Newark, N. J.; capital, \$50,000; incorporators, Fred Nuse, Fred Nuse, Jr., Louise Nuse, Maplewood.

O. A. R. Motor Company, Plainfield, N. J.; capital, \$100,000; incorporators, A. A. Reed, E. J. Kuhne, E. A. Kuhne, H. G. Uhler, H. G. Uhler, Jr.

Anderson Brothers Auto Company, Oskaloosa, Ia.; capital, \$5000; incorporators, Charles H. Anderson, F. M. Anderson.

C. L. Williams, Newark, N. J.; capital, \$50,000; incorporators, C. L. Williams, A. C. Hunt, A. Hammond.

The American Hydro-Aeroplane Company, Camden, N. J.; capital, \$100,000; incorporators, Edward R. Brown, Louis E. Corner, William B. MacDonald, all of Philadelphia

Garage Realty Company of West Hoboken, West Hoboken, N. J.; capital, \$10,000; incorporators, Louis Schmitt, Frank Eckert, Charles C. Clark.

Connecticut Commercial Car Company of Hartford, Hartford, Conn.; capital, \$50,000; incorporators, Joseph J. Rapter; Gustave F. Kallberg, James B. Henry.

Rayfield Motor Company, Chrisman, Ill.; capital, \$75,-000; incorporators, F. K. Thayer, A. E. Schnitker, A. E. Steley.

The B. & B. Auto Company, Davenport, Ia.; capital, \$10,000; president, Bert E. Brown; secretary-treasurer, H. S. Burnap.

R. H. Nesbitt Auto Company of Spartanburg, Columbia, S. C.; capital, \$10,000; incorporators, R. H. Nesbitt of Spartanburg and W. D. Nesbitt of Birmingham, Ala.



et Given to Cole Agents at New York City by Colt-Stratton Company at Which President J. J. Cole of the Cole Motor Car Company, Indianapolis, Ind., Presented Henry J. Habich with Gold Medal for Victories with a Stock Model.

McClurg Tire & Rubber Company, Boston; capital, \$12,000; president, John E. Horne; treasurer, Kirke L. Moses, 103 Massachusetts avenue, Boston; John S. Mc-Clurg.

Imperial Auto Sales Company, Madison, Wis.; capital, \$10,000; incorporators, Arthur F. Teigs, Mrs. Arthur F. Tiegs, Joseph E. Farber, Mrs. Joseph E. Farber,

Hydraulic Motor Vehicle Company, Milwaukee, Wis.;

capital, \$15,000; incorporators, Calvin Stewart, August Baltzer, W. M. Stewart, W. E. Brown.

Seymour Auto Company, Seymour, Conn.; capital, \$4000; incorporators, Ernest S. Clark, Thomas S. Coleman, Edward F. Coleman.

Penoa Motor Oil Company, Los Angeles. Cal.; capital,

\$25,000; incorporators, J. P. Smith, Joseph A. G. Brown, M. B. Armstrong.

The Capital City Automobile Company, Austin, capital, \$35,000; incorporators, Pierre Bremond, VGraham, Howell J. Grinnan, R. M. Thomson, Jr. W. M.

Rowe Motor Manufacturing Company, Camden, N. J.; capital, \$500,000; incorporators, Charles Def, Marion Lambert, Florence M. Caskill, 104 Market street, Camden.

000; president, R. H. Bruce; vice president, S. V. Gregory secretary, G. T. Sharp.

Patton Aeroplane Company, Montgomery, Ala.: capi tal, \$60,000; incorporators, Moses F. Patton, John L. Tyler, Hugo F. Budermann.

Interstate Tire & Rubber Company, New York City capital, \$500,000; incorporators, R. H. Falbaum, M. A. Gentry, L. R. Strauss, I. H. Falbaum, Atlanta, Ga.

GARAGE AND DEALER,

Wells & Morse, Johnstown, N. Y., Cole agent, has moved into new quarters and will be known in the future as the Cayadutta Garage.

G. A. Gillette and Stephen Zielinski, Rochester, N. Y., have filed plans for a new garage on East avenue. The proposed building will have a frontage of 33 feet and a depth of 115 feet. It will be constructed of brick and will cost about \$13,000.

R. F. Ford and E. and B. Starbuck, Peoria, Ill., have consolidated and the new concern will be known as the



Extensive Plant of the Stewart & Clark Manufacturing Company, Chicago, Well Known Maker of Speedometers, to Which a New Building Was Added Recently.

The Standard Motor Car Company, Tulsa, Okla; capital, \$5000; incorporators, W. L. Walker, William S. Baker, Clarence B. Sexton.

Amerital Manufacturing Company, New York City; capital, \$200,000; incorporators, W. O. Turrell, S. Seognamillo, L. W. Schwarz,

United States Co-Operative Automobile League, Cambridge, Mass.; capital, \$250,000; incorporators, George F. Mings and others.

Delamater-Byrnes Automobile Company, 10 West 60th street, New York City; capital, \$30,000; incorporators, J. D. Delamater, M. B. Byrnes, W. A. Shepard.

Bicknell Auto Company, Bicknell, Ind.; capital, \$15,-000; incorporators, E. T. Hollingsworth, S. S. Hollingsworth, J. A. Keith, H. A. Murray, John Carrico, Robert McClure, W. V. Gates.

Randolph Motor Truck Company of Delaware, New York City: capital, \$200,000; incorporators, H. O. Cough-

York City; capital, \$200,000; incorporators, H. O. Coughlin, Welcome W. Bender.

Bernhard & Turner Automobile Company, Des Moines, Ia.; capital, \$60,000; president and treasurer, J. C. Bernhard; vice president and secretary, Jay E. Turner.
Oakland Auto Company, Richmond, Va.; capital, \$15,-

Starbuck Sales Company and will handle the Cole line on a large scale.

W. P. Forbes, Richmond, Va., has moved from 10th and Byrd streets to new salesrooms and service department at 1631 West Broad street.

Carl Dearborn, Biddeford, Me., has purchased the business of the late Daniel H. B. Hooper on Washington

w. H. Downey of Rochester, N. Y., has succeeded W. S. Horton as manager of the Stoddard-Dayton garage at Syracuse, N. Y.

John D. Quinlan has taken the agency for the Schacht car, made by the Schacht Motor Car Company of Cincinnati, O., for Syracuse, N. Y. Associated with Mr Quinlan will be E. G. Coe.

The Inter-State Sales Company of Galveston, Texannounces the opening of a branch at Houston. The

announces the opening of a branch at Houston. company handles the Inter-State, Thomas and Everitt line and recently expended \$25,000 for a garage, salesroom and machine shop at Galveston.

L. M. Barton has resigned as treasurer of the Iowa Auto & Tire Company, Cedar Rapids, Ia., and has become associated with Leo M. Ford in the Barton-Ford



Motor Car Company. Mr. Barton's resignation becomes effective Feb. 1.

Milton Coombs, formerly engaged in the real estate business at Warren, O., has opened a garage on West Front street, Youngstown, which will be known as the Buick Sales Company.

The Astoria Garage Company at Willow and Franklin streets, Long Island City, N. Y., has been opened by a company headed by F. A. Simmons. The building

is of the latest fire proof design,

The Lexington Motor Car Company, Boston, which was organized recently to distribute Lexington cars, made by the Lexington Motor Car Company, Connersville, Ind., is now located in new salesrooms at Boylston and St. Cecilia streets,

The Herring Motor Car Company, Des Moines, which delivered 1146 Ford cars last year, is said to be one of the largest distributing houses in the country. The company announces that to date it is 267 ahead of the 1911 record.

The Abbott Motor Charlotte Company, Raleigh, N. C., announces a change in its name to that of the American Motor Car Company of which Julian L. Lummus is presi-

dent and W. Ruffin Smith, secretary.

The Shawnee Motor Car Company, Topeka, Kan., which was incorporated recently, has taken over the business of the Shawnee Motor Company, a partnership consisting of Frank Holland and B. F. Taylor. The new company has leased a building at 928 Kansas avenue and will make extensive alterations.

Harvey Parker, Worcester, Mass., special agent for Batavia tires, announces that he has taken the agency for the Palmer-Singer line, made by the Palmer & Singer Manufacturing Company, Long Island City, N. Y. S. G. Meredith, Richmond, Va., is building a garage on Monument avenue, between Sheppard and West streets.

The Broadway Motor Car Company has been formed at Columbus, O., to handle the Paige-Detroit in Franklin county and to do a general garage business. gan and H. F. Kaiser comprise the new concern.

Sperry & Hoover has taken over the repair business of the Adamson Automobile Company, at 35 West Mound street, Columbus, O. Mr. Adamson will continue to devote his attention to selling motor cars.

The Haus & Bitler Company, Wapakoneta, O., has taken the agency for Stoddard-Dayton cars.

WITH THE MANUFACTURER.

Edward Wells, Boston, who for three years has been connected with the E. R. Thomas Motor Car Company, both in Boston and Buffalo, has severed his connection therewith. He was assistant sales manager of the Thom-

as factory prior to his going to Boston.

The Ford Times, a monthly publication devoted to the interests of the Ford Motor Company, Detroit, has in its January number, an instructive article dealing with putting the model T car away for the winter.

Alden McMurtry announces that he has resumed the

Alden Memurtry announces that he has resumed the manufacture of the McMurtry mechanical horn which he states is the result of nine years experimental work.

C. L. Clark, formerly with the Driggs-Seabury Ordnance Corporation, and the Kelly Motor Truck Company, has joined the laboratory staff of the New Departure Manufacturing Company, Bristol, Conn., maker of ball bearings. Mr. Clark is a metallurgical engineer and graduated from the Case School of Applied Science at Cleveland. O. also the Ohio State University. Cleveland, O., also the Ohio State University.

The Findelsen & Kropf Manufacturing

maker of the Rayfield carburetor, announces the appointment of the following new agencies: Ballou & Wright, 86 Sixth street, Portland, Ore.; Browne & Leacy, Savannah, Ga.; Joseph Woodwell Company, 201 Wood street,

Pittsburg, Penn.

The Stewart & Clark Manufacturing Company, cago, well known maker of speedometers, completed recently a new building at a cost of \$100,000 in which modern machinery has been installed to take care of the drop forging end of the business. In the accompanying illustration is depicted the extensive plant of the company including the new structure.

The Henderson Motor Sales Company, Indianapolis, Ind., distributor of the product of the Cole Motor Car Company of that city, announces the appointment of new agencies as follows: George Mills, Shreveport, La.; H. F.

Russell, Ocean Springs, Mass.; Byron & Cunningham, 109 East Elm street, Waseco, Minn.; Warley & Terry. Viola, Ill.

George E. Daniels, general manager of the Oakland Motor Car Company, Pontiac, Mich., has appointed Thomas W. Wilson as works manager. as W. Wilson as works manager. Mr. Wilson has had an experience in the automobile industry extending over 15 years and was formerly general superintendent of the Flat plant at Poughkeepsie, N. Y.

The Team Owners Review, a publication devoted to the interests of team owners of this country and Canada. issued a special number Jan, 1 in commemoration of its 10th anniversary

The Ohio Motor Car Company, Cincinnati, O., announces the opening of an agency at Toronto, Can., with Hess & Meyers. The latter has a sub-agency at Massey, Ont. A new garage and salesroom, 50 by 150 feet, will be erected at Toronto and will be located on Richmond street, the centre of the automobile district.

The Colt-Stratton Company, New York City, eastern distributor of the Cole Motor Car Company, Indianapolis, Ind., gave a banquet in the former city recently at which the eastern agents of the company were the guests. It was the second annual smoke talk and William L. Colt presided as host. Agents were present from Maine to Maryland, also G. E. Roberts of Aukland, New Zealand. The feature of the banquet was the presentation of a gold medal to Henry J. Habich of the Boston agency by President J. J. Cole of the company in recognition of the excellent work of the former with a stock car in racing events during the past season. President Cole spoke of the new factory being erected, and Treasurer Frank Morrison dwelt upon the racing situation. Charles P. and R. P. Henderson of the Henderson Motor Sales Company, Chief Engineer Charles Crawford, A. F. Knob-lock and William L. Colt spoke upon subjects pertinent to the automobile industry.

The OttoMobile Company, Philadelphia, which was organized recently to take over the manufacture of pleasure and commercial vehicles, formerly made by the Otto Gas Engine Works, Philadelphia, announces that a new factory will be built at Mt. Holly, N. J. The Delamater-Byrnes Automobile Company has been awarded the New York territory and quarters have been estab-lished at 10 West 60th street. L. F. Hewlett has taken the Brooklyn agency and is located at 1270 Bedford ave-

The Shortsville Wheel Company, Shortsville, N. Y., maker of automobile wheels, is erecting an addition to its plant. The new structure will be of brick, 150 by 40

The Henderson Bulletin, issued by the Henderson Motor Sales Company, Indianapolis, Ind., contains in the current number a technical description of the Cole mo-

tor cars for which the company is distributor.

The Havers Motor Car Company, Port Huron, Mich., nounces the appointment of the following new The Havers Motor Car Company, Port Huron, Mich., announces the appointment of the following new agencies: R. H. Ives & Co., Binghamton, N. Y.; E. T. Wood Company, Worcester, Mass.; George McCutcheon, Butte, Mont.; B. A. & R. Cunningham, Hackensack, N. J.; R. H. & H. C. Gray, Seattle, Wash.; L. P. Strayer, Rock Island, Ill.; M. T. Dill, New Haven, Conn.

The Velle Boston branch announces the following new agencies and reappointments for pleasure and com-mercial cars made by the Velle Motor Vehicle Company, Moline, Ill.: R. J. Flynn, Hartford, Conn.; J. A. Alderman, Suffield, Conn.; Tucker & Palmer, Tariffville, Conn.; Homer H. Judd, Bristol, Conn.; Walter B. Johnson, Essex Junction, Vt.; H. C. Purves, St. Stephen, N. B.; Shean Auto Station, Boston, for Springfield, Mass., and surrounding towns. The following agencies have been closed by the Velie Chicago branch: Moran Auto Sales Company, Grand Rapids, Mich.; J. F. Charley Auto Company, Evansville, Ind. All agencies will maintain the service station policy of the company.

The Iroquois Top Company, Utica, N. Y., recently elected the following directors: F. W. Dygert, Patrick A.

Gormican and Fred Widme,

R. S. de Mitkiewicz has resigned as sales manager of the Motor Engineering & Sales Company of New City to accept a position in the truck department of the Peerless Motor Car Company of New York.

Arthur G. Beharrell has closed with the Velie Boston branch for the sale of Velie cars in Lowell, Mass., for the

fourth year. He will establish a service station.





COMING EVENTS.

January.

Jan. 27-Feb. 3-Pleasure car show, Chicago, Ill. Jan. 27-Feb. 3-Pleasure car show, Pittsburg, Penn. Jan. 29-Feb. 3-Show, Scranton, Penn. Jan. 29-Feb. 3—Dealers' show, Minneapolis, Minn.

Jan. 29-Feb. 3-Show, Montgomery, Ala.

February.

Feb. 1- 7—Show, Washington, D. C. Feb. 3-10-National show, Montreal, Can. Feb. 3-10-Show, Harrisburg, Penn.

Feb. 5-10—Commercial car show, Chicago, Ill.

Feb. 5-10—Commercial car show, Pittsburg, Penn.

Feb. 5-10-Pleasure car show, St. Louis, Mo.

Feb. 5-10—Show, Buffalo, N. Y. Feb. 5-10—Show, Bangor, Me. Feb. 10-17—Show, Atlanta, Ga.

Feb. 12-17—Commercial car show, St. Louis, Mo.

Feb. 12-17-Show, Memphis, Tenn.

Feb. 12-17-Show, Ottawa, Can.

Feb. 12-17-Show, Fall River, Mass.

Feb. 12-17-Show, Kansas City, Mo.

Feb. 12-19-Show, Dayton, O.

Feb. 14-17—Show, Grand Rapids, Mich.

Feb. 17-24—Exposition show, Pittsburg, Penn.

Feb. 17-24—Association show, Minneapolis, Minn.

Feb. 17-24—Show, Newark, N. J.

Feb. 17-24-Show, Cleveland, O.

Feb. 19-24—Show, Omaha, Neb.

Feb. 19-24-Show, Hartford, Conn.

Feb. 19-24—Show, Cincinnati, O.

Feb. 19-24-Show, Portland, Me.

Feb. 20-24-Show, Binghamton, N. Y.

Feb. 20-25-Show, New Orleans, La. Feb. 20-28—Show, Baltimore, Md.

Feb. 21-23-Show, Keene, N. H.

Feb. 21-24—Show, Louisville, Ky.

Feb. 21-28—Show, Toronto, Can.

Feb. 24-March 2-Show, Brooklyn, N. Y.

Feb. 26-March 2-Show, Paterson, N. J.

Feb. 26-March 2-Show, Elmira, N. Y.

Feb. 28-March 2-Show, Davenport, Ia.

March 2-9 -Show, Norfolk, Va.

March 2-9 - Pleasure car show, Boston, Mass.

March 4-9 -Show, Des Moines. Ia.

March 4-10-Show, Denver, Col.

March 6-9 -Show, Tiffin, O.

March 11-16-Show, Cedar Rapids, Ia.

March 12-16-Show, Syracuse, N. Y.

March 13-20—Commercial car show, Boston, Mass.

Massachusetts demands that every vehicle using the public highways during the hours of darkness shall be equipped with suitable lights. Why don't you advocate a similar measure for your state? Now is the time to act.

SPECIAL SHOW TURNTABLE.

One of the features of the Madison Square Garden show in New York City, was the novel method employed by the Brush Runabout Company, Detroit, in displaying its product on an exhibition turntable. The latter was nine feet in diameter and fitted with a wooden top and was kept in motion by a motor which revolved the device at the rate of three turns a

The table was manufactured especially by the Portland Garage Company, Portland, Me., maker of the well known Portland automobile turntable, and the construction is such that it can be transported easily from place to place. It does not have to be taken apart as it is shipped on skids at an angle of 45 degrees and may be placed readily in a box car. Brush Runabout Company will utilize the turntable at the Chicago, Indianapolis and Boston shows. In addition to manufacturing these devices the Portland Garage Company makes a repairman's couch which is upholstered and fitted with an adjustable head rest.

GUIDES FOR GOODYEAR FACTORY.

One of the innovations introduced in the tire industry recently is that of opening a special department in the plant of the Goodyear Tire & Rubber Company, Akron, O., for the purpose of showing visitors through the various buildings. The number of persons visiting the plant has increased so rapidly that the officers and assistants have been unable todevote the proper attention to their guests. To insure that each shall have full opportunity to see the construction of tires from the time the crude rubber is received until the finished article is produced, the company has selected guides of experience in tire making to accompany the visitors, and explain the various processes.

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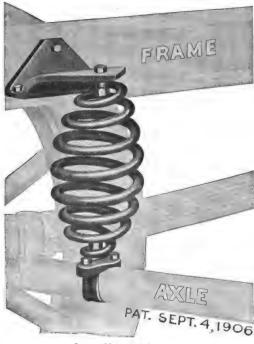
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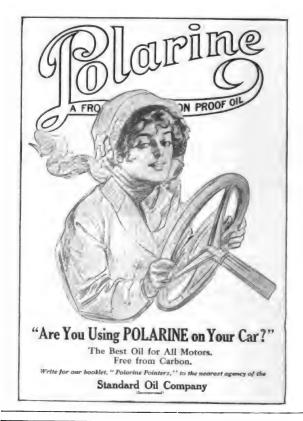
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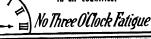
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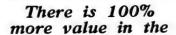
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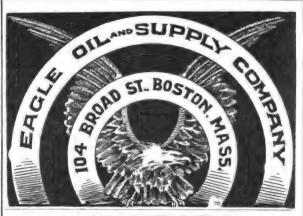
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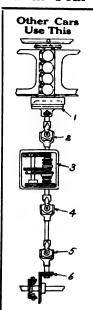
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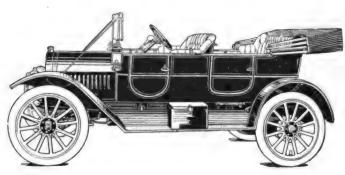
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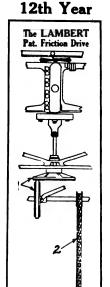


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Cartercar Co., Pontiac, Mich. (Cartercar.)

Couple-Gear Freight-Wheel Co., 540 Buchanan St., Grand Rapids, Mich. (Couple-Gear.) Branches: See Cars—Electric Commercial.

Knox Automobile Co., Springfield, Mass. (Knox.)

Sampson Mfg. Co., Alden, 8 West 61st St., New York City. (Samp-West son.)

United States Motor Co., 8 West 61st St., New York City. (Sampson.)

Victor Motor Truck Co., St., Buffalo, N. Y. (Victor.) White Co., The, 828 E. 79th St., Cleveland, O. (White.) Branches: See Cars — Gasoline

Willys-Overland Co., Toledo, O. (Overland.)

CHAINS, TIRE.

Atlas 34 85th tlas Chain Co., 34 3 Brooklyn, N. Y. (Atlas.)

See Cars-Gasoline McLain & Co., H. E., 165 Pond St., Natick, Mass.

CLASSIFIED BUYERS' GUIDE—Continued

TRANSMISSION OR CHAINS -DRIVING.

Heffnuag & Co., S., Ltd., 118 Broad St., New York City (Coventry.)

Miller, Chas. E., 97-103 Reade St., New York City (Brampton).

Branches: See Accessory Manufac- Edison turers and Jobbers.

CLOCKS FOR DASHBOARD, ETC.

Boston Clock Co., 16 State St., Boston, Mass.

Chelsea Clock Co., 16 State St., Boston, Mass.

CLUTCHES - AUTOMOBILE FRIC-TION.

Brets Co., J. S., 250 W. 54th St., New York City (Hartford cone.)

CONNECTORS AND TERMINALS.

Beek Co., The, Box 67c, Rockville MAGNETOS AND MAGNETO SUP-Centre, N. Y.

Milwaukee Auto Specialty Co., 128 Second St., Milwaukee, Wis.

Prest-O-Lite Company (Prest-O-Carbon Remover). See under Acety-lene Tanks for address of main office and branches.

FUNNELS, AUTO.

Dover Stamping & Manufacturing Co., Cambridge, Mass. (Dover.)

GASOLINE MIXING DEVICES.

Royal Equipment Co., 422 Housatonic Ave., Bridgeport, Conn. (Gyrex.)

HORNS-BULB, ELECTRIC, EX-HAUST.

Automobile Supply Mfg. Co., 220 Taaffe place, near De Kalb Ave., Brooklyn, N. Y. (Newtone.)

Randail-Faichney Co., Boston, Mass. (Jericho, Jubilee.)

JACKS AND LIFTING DEVICES.

Hartford Suspension Co., 146 Bay St., Jersey City, N. J.

Branches: 1700 Broadway, 212-214 W. 88th St., New York City; 325 Columbus Ave., Boston, Mass.; 1437 Vine St., Philadelphia, Penn.; 1458 Michigan Ave., Chicago, Ill.; 239 Halsey St., Newark, N. J.; 1524 Grand Ave., Kansas City, Mo.

LAMP COVERS.

Hopewell Brothers, Newton, Mass. (Hopewell.) Branch: 1974 Broadway, New York American F. N. Co., Boston, (F. N.) City.

LAMPS-HEAD, TAIL AND SIDE.

Gray & Davis, 55 Lansdowne St., Boston, Mass.

LIGHTING EQUIPMENT - ELEC-TRIC.

dison Storage Battery Co., 187 Lakeside Ave., Orange, N. J. Esterline Company, Lafayette, Ind.

(Matchless.) (Matchiess.)

Branchess: Detroit, Mich.; San

Francisco, Cal.; 196 Pine St., Atlanta, Ga.; 114 Liberty St., New

York City; Exchange Bldg., 58

State St., Boston, Mass.; 16 E.

Main St., Waterbury, Conn.; 810 ½

Chanel St. New Heyen, Conn.; 810 ½ Chapel St., New Haven, Conn.

Geissler Bros., Storage Battery Co., 514-520 W. 57th St., New York

City.

Gray & Davis, 55 Lansdowne St.,
Boston, Mass.

K-W Ignition Co., The, 2829 Chester

Ave., Cleveland, O.
Sager Co., J. H., 271 South Ave.,
Rochester. N. Y. Rochester, N.

CYLINDER CLEANING COMPOUND. Bosch Magneto Co., 223-225 W. 46th

St., New York City. Branches: 119-121 E. 24th St., Chicago, Ill.; 1250 Woodward Ave., Detroit, Mich.; 357 Van Ness Ave.,

San Francisco, Cal.
Brets Co., J. S., 250 W. 54th St., New
York City. (U. & H.)
Connecticut Telephone & Electric

Connecticut Co., 10 Britannia St., Meriden, Conn.

Branches: 819-A Boylston St., Boston, Mass.; 1783 Broadway, New York City; 1146 Michigan Ave., Chicago, Ill.; 544 Van Ness Ave., San cago, Ill.; 544 Van Ness Ave., San Francisco, Cal.; 1518 Broadway, Denver, Col.; 510-511 Majestic Bldg., Detroit, Mich.; 12 So. Eighth St., Minneapolis, Minn. Hers & Co., 295 Lafayette St., New York City. (Herz.) K-W Ignitien Co., The, 2829 Chester Ave., Cleveland, O.

220 Marburg Bros., 1777 Broadway, New Ave. York City (Mea.) Simms Magneto Co., 1780 Broadway, New York City.

Works: Bloomfield, N. J. Splitdorf, C. F., Walton Avenue, and 138th St., New York City. Branches: 1679 Broadway, New York City, 1110 S. Michigan Ave., Chicago, Ill.; Motor Mart, Boston, Mass.; 430-36 Van Ness Ave., San Francisco, Cal.; 368 Woodward Ave., Detroit, Mich.; 1226 S. Olive St., Los Angeles, Cal.

MEASURES, ETC.

Dover Stamping & Manufacturing Co., Cambridge, Mass. (Simplex.)

MOTORCY-MOTORCYCLES AND CLE SUPPLIES.

Branches: 49 Union St., Provi-

dence, R. I.; 415 Trumbull St., Hartford, Conn.

Emblem Mfg. Co., Angola, N. Y. (Emblem.) wenson, B. A

wenson, B. A., 298 Blackstone St., Providence, R. I. (Indian.)

MOTORING ORGANIZATIONS.

Federation American Motorcyclists, E. M. Estabrook, Bangor, Me. International Automobile Associa-tion, Sheldon M. Booth, Old South Bldg., Boston, Mass.

MOTORS AND POWER PLANTS.

Hazard Motor Mfg. Co., 122 Coates St., Rochester, N. Y. (Hazard.) Western Ind. (Rutenber.)

OTHER OILS, GREASES AND LUBRICANTS.

Borne, Serymser Co., 80 Sout New York City (Colonial.) 80 South St., Branches: Boston, Fall Mass.; River, Mass.; Philadelphia, Penn. Dixon Crucible Co., Jos., Jersey City. N. J. (Graphite.)

Eagle Oil & Supply Co., 104 Broad St., Boston, (Eagleine No-Karbon) 104 Broad Fiske Bros. Refining Co., New York City. (Lubroleine.) Branch: Pittsburg, Penn.

Harris Oil Co., A. W., 326 South Water St., Providence, R. I. (Harris.) Branch: 66 Wabash Ave., Chi-

CARO

Haveline Oil Co., 188 William St., New York City (Havoline.) Haws, Geo. A., 77 Pine St., New York City (Panhard.) Branch: 899 Boylston St., Boston, Mass.

Kellom & Co., Chas. F., 113 Arch St., Philadelphia, Penn. (Invader.) Branch: 284 Columbus Ave., Boston, Mass.

Kincaid Oil Co., 219-221 West Exchange St., Providence, R. I. (Kincaid.)

Miller, Chas. E., 97-103 Reade St., New York City (Pan-American.) Branches: See Accessory Manufacturers and Jobbers.

New York Lubricating Oil Co., 116 Broad St., New York City. (Monogram.)

Branches: 126 Massachusetts Ave., Boston, Mass.; 423 Passaic Ave., East Newark, N. J.; 407 Franklin Bank Bldg., Philadelphia, Penn.; 1436 Michigan Ave., Chicago, Ill.; 1111 Superior Ave., N. W., Cleveland, O.; 435 Turk St., San Francisco, Cal.; 618 Banning St., Los Angeles, Cal.; 177 The Vale, Acton, London, W., England; P. O. Box 619, Johannesburg, South Africa.

New York & New Jersey Lubricant Co., 165 Broadway, New York City (MoToRol, Non-Fluid, Kejex.)

CLASSIFIED BUYERS' GUIDE---Continued

Standard Oil Co., New York City (Polarine.)

Branches: In all cities.

Vacuum Oil Co., Rochester, N. Y. (Mobiloil.) Branches: 49 Federal St., Boston, Mass.; 605 Brown Bros. Bldg., Philadelphia, Penn.; 154 Exchange St., Bangor, Me.; 406 Hitchcock Bldg., Springfield, Mass.; 117 Commercial St., Portland, Me.

Valveline Oil Co., 27 State St., Boston, Mass. (Valvoline.)

Wolverine Lubricants Co., \$0 Broad St., New York City (Wolverine.) Branches: 1402 Michigan Ave., Chicago, Ill.; 224 Milk St., Boston, Mass.; 119 North Front St., Philadelphia, Penn.; 702 Candler Bldg., Atlanta, Ga.

OIL AND GREASE GUNS.

Randall-Faichney Co., Boston, Mass. (B-Line.)

PRIMING PUMPS.

Crone, F. G., 331 Genesee St., Buffalo, N. Y. (Crone.)

AND PUMPS — HAND ENGINE OPERATED.

Bridgeport Brass Co., 124 Crescent St., Bridgeport, Conn. (Atlas.)

RIMS — REMOVABLE AND DE-TACHABLE

Firestone Tire & Rubber Co., Akron. O.

Branches: In all principal cities. Branches: In all principal cities.

Michelin Tire Co., Milltown, N. J.

Branches: Boston, Mass.; Buffalo,
N. Y.; New York City; Philadelphia, Penn.; Cleveland, O.; Chicago, Ill.; Detroit, Mich.; Denver,
Col.; San Francisco, Cal.; Seattle,

Week Wash.

United States Tire Co., Broadway and 58th St., New York City (Continental and Whittelsey Demontachable.)

Branches: New York, Chicago, San Francisco.

ROAD BUILDING MATERIALS,

Barrett Manufacturing Co., New York City (Tarvia.) Branches: Chicago, Ill.; Philadel-phia, Penn.; Boston, Mass.; St. Louis, Mo.; Cleveland, O.; Pitts-burg, Penn.; Cincinnati, O.; Kansas City, Mo.; Minneapolis, Minn.; New Orleans, La.; Seattle, Wash., London, Eng.; Montreal, To Winnipeg, Vancouver, Can John, N. B.; Halifax, N. S. Toronto, Can.; St.

SHOCK ABSORBERS AND SUP-PLEMENTARY SPRINGS.

Connecticut Shock Absorber Co., 10 Britannia St., Meriden, Conn. See Magnetos Branches: Magneto Supplies.

Hartford Suspension Co., 146 Bay St., Jersey City, N. J. (Truffault-Hartford.)

Sager Co., ager Co., J. H., 271 South Ave., Rochester, N. Y. (Peerless.)

SOAPS.

Hopewell Brothers, Newton, Mass. (Paos.) Branch: 1974 Broadway, New York

SPARK PLUGS AND IGNITERS.

Bosch Magneto Co., 223-225 W. 46th St., New York City. Branches: See Magnetos and Magneto Supplies.

Delta Mfg. Co., Bloomfield, N. J. Hardy Co., R. E., 1134 Austin Ave., Chicago, Ill. (Sta-Rite.)

Hers & Co., 295 Lafayette St., New York City (Bougle Mercedes.)

Janney, Steinmets & Co., Philadel-delphia, Penn. Lucas & Co., Brookline, Mass. (Sta-

Rite.) Mac-Kae Manufacturing Co., Bos-

ton, Mass. (Mac-Kae.)
plitdorf, C. F., Walton Ave. and
138th St., New York City.
Branches: See Magnetos and Mag-Splitdorf, neto Supplies.

Walker Machine Co., G. A., 88 Brain-tree St., Allston Station, Boston, Mass. (Ballite.)

SPARK PLUG TERMINALS.

Mac-Kae Manufacturing Co., Boston, Mass. (Mac-Kae Universal.)

SPEEDOMETERS AND RECORD-ING DEVICES.

lumbus Ave., Boston, Mass. Branches: 1919 Broadway, 2081 Euclid City; Ave.. York Cleveland, O.

Jones Speedometer, New Rochelle, N. Y.

Branches: Broadway and 76th St., New York City: 109 Massachusetts Ave., Boston, Mass.; 1416 Vine St., Philadelphia, Penn.; 1430 Michigan Ave., Chicago, Ill.; 852 Main St., Buffalo, N. Y.; 41 Washington Boulevard, Detroit, Mich.; 544 Van Ness Ave., San Francisco, Cal.; 1229 So. Olive St., Los Angeles, Cal.; 329 Ankeny St., Portland, Ore.; 917 E. Pike St., Seattle, Wash.

Stewart & Clark Mfg. Co., 1828 Diversey Boulevard, Chicago, Ill. (Stewart.)

Branches: 1312 Michigan Ave., Chicago, Ill.; 233 West 58th St., New York City; 1211 Woodward Ave., Detroit, Mich.; 307 Golden Gate Ave., San Francisco, Cal.; 1212 South Main St., Los Angeles, Cal.; 608 North Broad St., Philadelphia, Penn.; 514 North Capitol Indianapolis, Ind.; 1825 Ave., Grand Ave., Kansas City, Mo.; 45 South 10th St., Minneapolis, Minn.; 1849 Euclid Ave., Cleveland, O.

Branches: See Jacks and Lifting
Devices.

ager Co., J. H., 271 South Ave.,
Rochester, N. Y. (Peerless.)

Warner Instrument Co., 1221 Wheeler Ave., Beloit, Wis. (Auto-Meter.)

Mich.; 330 ½ North Illinois St.,
Indianapolis, Ind.; 1613 Grand

Ave., Kansas City, Mo.; 748 S. Olive St., Los Angeles, Cal.; 1902 Broadway, New York City; 302 N. Broad St., Philadelphia, Penn.; 5940 Kirkwood Ave., Pittaburg, Penn.; 5940 Kirk-wood Ave., Pittaburg, Penn.; 14 N. Seventh St., Portland, Ore.; 36-28 Van Ness Ave., San Francisco, Cal.; 611 E. Pike St., Seattle, Wash.; 3923 Olive St., St. Louis, Mo.

> SPRINGS FOR AUTOMOBILE SUS-PENSION.

> Perfection Spring Co., 1542 Superior Ave., N. W., Cleveland, O.

STORAGE SYSTEMS — GASOLINE AND OIL.

Ideal Oil Pump & Tank Co., 146 Sum-St., Boston, Mass.

Januey, Steinmets & Co., Philadel-phia, Penn.

TANKS FOR FUEL AND WATER,

Janney, Steinmets & Co., Philadel-phia, Penn.

THERMO CASES.

Dover Stamping & Manufacturing Co., Cambridge, Mass.

Casgrain Speedometer Co., 172 Co. TIMERS AND SPARK COMMUTA-TORS.

> K-W Ignition Co., The, 2829 Chester Ave., Cleveland, O. brator.) (Master Vi-

TIRE CASES.

Hopewell Brothers, Newton, Mass. (Hopewell.)

Branch: 1974 Broadway, New York City.

TIRE CASINGS AND INNER TUBES.

Ajax-Grieb Rubber Co., Trenton, N. J. (Ajax.) Branches: 15 Park square, Boston, Mass.; 1731 Michigan Ave., Chicago, Ill.; 905 First Ave., South, Minneapolis, Minn.; 1529 Cleveland Place, Denver, Col.; 1088 South Main St., Los Angeles, Cal.; 544 Van Ness_Ave., San Francisco, Van Ness Ave., San Francisco, Cal.; 917 East Pike St., Seattle, Wash.; 316 North Broad St., Phila-Wash.; 51e North Broad St., Finnadelphia, Penn.; 1776 Broadway, New York City; 48 Auburn Ave., Atlanta, Ga.; 743 Woodward Ave., Detroit, Mich.; 1616 Grand Ave., Kansas City, Mo.

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Consolidated Rubber Tire Co., 20 TIRE TOOLS AND REMOVING TURNTABLES FOR PUBLIC AND Vesey St., New York City (Kelly- EQUIPMENT. PRIVATE GARAGES. Springfield.)

branches: Chicago, Ill.; Philadelphia, Penn.; Boston, Mass.; St. Beck Co., The, Box 67c, Rockville Lausing Wheelb Louis, Mo.; Detroit, Mich.; Cincin-Centre, N. Y. nati, O.; San Francisco, Cal.; Los Angeles, Cal.; Akron, O.

Empire Tire Co., Trenton, N. J. Branches: 292 Devonshire St., Bos-Branches: 292 Devonshire St., Boston, Mass.; 1305 Michigan Ave., Chicago, Ill.; 842 Woodward Ave., Detroit, Mich.; 264 Halsey St., Newark, N. J.; 73rd St. and Broadway, New York City; 148 Chambers St., New York City; 322 North Broad St., Philadelphia, Pann Penn

Branches: See Rims-Removable and Detachable

Goodyear Tire & Rubber Co., Griswold St., Akron, O. (No-Rim-Cut.) Branches: In principal cities.

Michelin Tire Co., Milltown, N. J. Branches: See Rims—Removable and Detachable.

Shawmut Tire Co., 97 Bedford St., Boston, Mass.

United States Tire Co., Broadway and 58th St., New York City (Con-tinental, G & J, Hartford, Morgan & Wright.)

Branches: See Rims-Removable and Detachable.

TIRE CHAIN GRIPS.

Atlas Chain Co., 34 35th St., Brooklyn, N. Y. (Atlas.)

TIRE INFLATING TANKS.

Prest-O-Lite Company (Baby Tire Filler, The Emancipator). See under Acetylene Tanks for address of main office and list of branches.

TIRE PRESERVATIVES AND PRO-TECTORS.

Michelin Tire Co., Milltown, N. J. (Mastic.)

Branches: See Rims, Removable and Detachable.

Page-Lester Co., 129 W. Van Buren St., Chicago, Ill. (Tite-Wad Rubber Putty.)

Tingley, C. O., & Co., Rahway, N. J. (C. O. T. Tire Solder)

TIRE SLEEVES.

Selbach Rubber Co., 404 Atlantic Ave., Boston, Mass. (Selbach Safety.)

TIRES-CUSHION.

Mots Tire & Rubber Co., The, Ak-ron, O. (Electric Special, Mots City, Mo. Cushion.)

neapolis, St. Paul.

Pitless Auto Turntable Co., Kansas.

City, Mo.

Portland Garage, Portland, Me.

Branches: New York, Chicago, Detroit, Kansas City.

TIRES-MOTORCYCLE,

Firestone Tire & Rubber Co., Ak-ron, O.

Branches: See Rims...Removable

United States Tire Co., Broadway and 58th St., New York City (Mor-gan & Wright, G & J.)

Branches: See. Rims-Removable and Detachable.

TIRES-SOLID AND COMMERCIAL TYPES.

Ajax-Grieb Rubber Co., Trenton, N. J. (Ajax.) Branches: See Tire Casings and Inner Tubes

Conselidated Rubber Tire Co., 20 Vesey St., New York City (Kelly-20 Springfield.)

See Tire Casings and Branches: Inner Tubes.

Firestone Tire & Rubber Co., Akron, O.

Branches: See Rims-Removable and Detachable.

Michelin Tire Co., Milltown, N. J. Branches: See Tire Casings and Inner Tubes.

Mots Tire & Rubber Co., The, Akron, O. (Mots.) Branches: See Tires-Cushion.

Republic Rubber Co., Youngstown, O. (Republic.)

United States Tire Co., Broadway ford, Conn.
and 58th St., New York City.
Branches: See Rims—Removable WINDSHIELDS AND WINDSHIELD and Detachable.

TOPS AND ATTACHMENTS FOR Comover AUTOMOBILES.

Springfield Metal Body Co., 20 Medford Ave., Springfield, Mass.

TORSION SPRINGS.

Aeme Torsion Spring Co., 21 Cambria St., Boston, Mass. (Acme.)

TROUBLE FINDERS.

Hopewell Brothers, Newton, Mass. (Vibrator.)

amsing Co., formerly Lansing Wheelbarrow Co., Lansing, Mich. formerly Lansing Branches: Factory, Parkin, Ark.; Chicago, New York, Kansas City, Philadelphia, San Francisco, Min-neapolis, St. Paul.

(Portland.)

UNIVERSAL JOINTS.

Brets Co., J. S., 250 W. 54th St., New York City (Hartford.) Broadway Kinsler-Bennett Co., The, Hartford. Conn. (Kant-Break.)

VALVE DRESSERS.

Crone, F. G., 381 Genesee St., Buffalo, N. Y.

VALVE STEM ADJUSTORS.

Auto Parts Co., Motor Ave., Providence, R. I. (Apco.)

AUTOMOBILE VARNISHES FOR BODIES.

U-Aute-Varnish Co., Cleveland, O. Branch: 218 Columbus Ave., Boston, Mass.

WASHING DEVICES FOR GARAGES.

Perfect Mfg. Co., Albany, N. Y.

WELDING AND WELDING PROCESSES.

Welding Co., The Springfield, Mass. The, 51 Bay St.,

Branches: 63 Southampton St. Boston, Mass.; 46 Elm St., Hart-

CLEANERS.

pnover & Robinson, 244-252 W. 54th St., Motor Hall, New York City (Boreas.)

WIRE MECHANISM.

Brets Co., J. S., 250 W. v York City (Bowden.) J. S., 250 W. 54th St., New

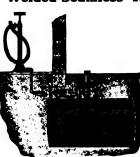
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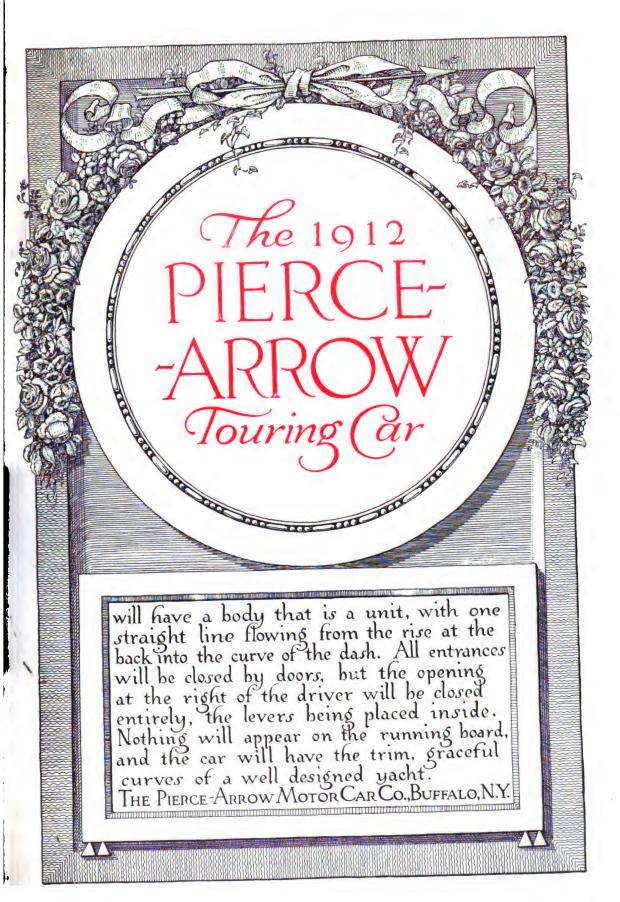
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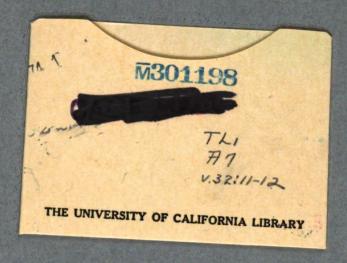
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